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Shadows and Straws

ON THE THIRTIETH DAY OF APRIL, at Nashville, Tennessee, the American Institute of Architects will hold its fifty-second annual convention. In chronicling the approach of the event, one might easily surrender to temptation and characterize it with sweeping superlatives, indicative of the solemn moment in which we live and the profound nature of the problems which today are the anxiety, and even the terror, of the western world. In a general survey of the chaos in Europe, a gathering of architects in far-away Tennessee might well be lost to the eye, so inconsequential would it appear, if it appeared at all, and so remotely would such a gathering seem to be connected with the all-absorbing problem of remapping Europe—a problem into which the agents of greed and avarice have already sunk their inhuman claws, oblivious of the warning which flames from every corner of the countries, some one of which each member of this foul brood of vultures calls his own. Against them is arrayed a hardy group of pioneers. They have an idea which has been born out of the tragedy from which we have barely emerged. They call it the League of Nations. They believe it to offer a basis for a new international relationship. They put it forth, in all its crudeness, in the hope that a smitten world may at least recognize its worthiness as an idea and be willing to help in bringing about a practical fruition.

There are many who regret that the idea could not have been called a League of Peoples, and also that the first draft put forward bears so strong a resemblance to an Alliance of Might, but none of these considerations should be allowed to dissuade every man or woman who possesses even a modicum of intelligence, from weighing the idea. If humanity at large shows signs of championing it, then the politicians and diplomats will endeavor to formulate its constitution to their own economic and political ends. Nothing else is to be expected from those gentry; only a determined popular will can prevent it and the consequences that will follow as surely and as swiftly as death follows the hemlock cup.

TO SAY THAT THE MOMENT is a solemn one is to put it all too lightly. The most giant forces of destruction ever organized by man have been turned loose upon humanity for four terrible years. The sum of their destruction is beyond human comprehension. As individuals we are utterly incapable of even a faint appreciation of the wreck and ruin which lie heavy on the nations of Europe. Not alone upon the battlefields does one need to wander in search of a clue. Their desert areas, pillaged, raped, and ravaged, are but the half of the story. To find and understand the other half, one must enter the homes and the hearts of the millions who have suffered their loss in heroic silence, and one must go farther, much farther, yet. One must enter the factories and workshops of the world and try to gain an understanding of the complete disorganization which here exists, the evidence of which is piling up before us with the inflexible regularity of the succeeding days. The world has been dealt a wound which still gapes at us in mocking ghastliness, and from which the blood still continues to pour in an unbroken stream. Starvation is stalking a vast area of Europe

with the sickle of Death whetted to the keenness of a razor-edge. By thousands it mows them down—the little children, the under-nourished mothers making their fearful sacrifice in vain, the weakened fathers, the wondering aged! To catch even a faint glimpse of this sum of human misery makes one sick at heart indeed, and sicker still as one contemplates the character of the political game everywhere being played by the old group of politicians and diplomats. To them any idea of international unity is abhorrent. The bombast and jingoism of party politics has poisoned their souls beyond redemption and mutilated their intelligence beyond restoration. If their machinations prevail, then civilization may well tremble for the result, the character of which will be revealed to any inquirer who can gain access to the preparations now being discussed in every war department of the world. When Destruction is again turned loose on mankind, it may well be doubted whether civilization can survive the new forms of those terrors through which it seems now to have passed with wounds not mortal.

What Causes These Things? Is it men, lost to every sense of humanity, or is it a fearful system in which they are so enmeshed that escape is hopeless? Is there a possible method of reducing the problem to the terms of some simple human equation? Can there be formulated one single question—one hypothesis—understandable to every human being and capable of resolving the whole problem into something which even a child may grasp and understand? We are sick with the terminology of politics, with the endless phraseology of economics, with the maundering platitudes of the sociologists and the philanthropists, with the pitiful and pathetic hollowness of the pulpit. Before the problem of four years ago they all stood helpless like so many tottering and palsied seniles. Before the problem of today they stand just as helpless, just as impotent, just as weak, and instead of lending a stalwart shoulder to the great human cause which cries out in its agony, they merely seek aid for the trembling legs on which they have so long walked as objects of pity and contempt. "Save us," is their cry, and one by one each vested right (every vested right is in reality a vested wrong) takes up the cry and sends it along. The unity accomplished in the face of a common enemy bent upon conquest is dissipated over night into a wild scramble for self-protection. And once again one asks, with a passionate appeal for light, What is the cause? Is it that men are lost to humanity, or is it that they are only lost in a maze of economic jungle, out of which they can find no issue?

Men Will Answer This Question, each after his own fashion. Every man has his religion and his philosophy. He cannot live without them, even though he may be largely unconscious of their existence, but even the conscious possessors of a religion or a philosophy which they believe to be deep and powerful forces in their lives, may find it impossible to make any practical use of either. Christianity, which seems to most of us in the western world to be at once the beginning and the end of the spiritual life of man, stands denied by all of us. We cannot practise it except in degree. Not one of us has the courage to practise it to its ultimate finality. Not one of us knows how to so practise it that we shall have none other gods but God, and that we shall love our neighbor as ourselves, and yet on these two commandments hang all the law and the prophets. Christianity is, after all, only an idea. As a religion susceptible to use in everyday life, it is, so far, we complain, a complete failure. And yet, look where we will, search the heavens as we may, implore and beseech and pray for light as we must, no other answer is vouchsafed. The world will be saved by love, and not by hate. Christianity means the judge prostrate before the criminal, in abasement before his own human weaknesses. Christianity means that there is no punishment for men save that which they voluntarily bring upon themselves through the conscious knowledge of the wrong they have done, and that reparation must be through the conscious will to make it by suffering and through sacrifice. Christianity means the acceptance of Life as the one value by which anything can be measured. It is at once the scales that weigh and that which is weighed in the scales. It is Life as one and inseparable; it is the acceptance of mankind as divine through its own divinity, human through its own humanity, strong through its own strength, weak through its own frailty. "There is no value but Life."

THE FIFTY-SECOND CONVENTION of the American Institute of Architects can do nothing better than to take consideration of these simple truths, as it deliberates upon the various and complex problems which have now demanded a too long deferred attention. Architects' problems are not peculiar. They are not, as so many seem to think, questions which can be detached from the whole great problem, put under a microscope, subjected to physical and intellectual tests, and be answered with a simple prescription to be mixed and taken until cured. The same system which enmeshes the world does not exclude the building industry. The same unscalable wall before which others stand in mute surrender to economic laws, the denial of which means poverty and the pauper's field, rises to hedge them in. Our civilization has ordained that we must and shall live by the law of the selfish motive. Unselfish we may be, here and there, but the law is that we must live and fight for our own existence, no matter what other existences may go down in the struggle. The soldiers fall on the battlefields in the ecstasy of attack and defense, in that mortal combat which the world has sanctified with the title of "glorious," but the battlefields of peace claim their dead in silence, without glory, and without honor. Christianity has not failed! *It has not even been tried!* It has been left to pander to the emotions while its ministers let their tongues be withered by the same laws that wither us all. The law of profit reigns supreme over the law of brotherhood and love of neighbor. We are all caught in the same bramble; together we are lost in the same maze; the jungle of barter and sale is our prison; on the endless desert of selfishness lie the unseen skeletons of our spiritual lives. They have known their moments of ecstasy and escape, but only the divine few have in life, thrown off their manacles forever.

WHAT CONCLUSION SHALL WE REACH? Shall we try to "reform" men, or shall we try to work toward a system which will enable them to reform themselves? Shall we try to make better architects by education and by precept, or shall we try to bring about such changes in our economic system as will make it possible for those who build to demand both good architects and good architecture? Shall we try to devise new rules and regulations, new codes and canons, or shall we become humble in the presence of our own humanity and learn to look with a little more tolerance upon those who live by practising a profession in accordance with principles which differ from our own? Shall we continue to salve our own consciences by proclaiming our sacred impeccability, or shall we look at ourselves as we are and admit our impotence to live wholly by the truth that we announce as peculiarly our own?

And, last of all, shall we approach our problem as the inseparable part and parcel of the sickening malady which is both the road to perpetual war and its legacy as well, or shall we study it as a mere indisposition which temporarily depletes our income? The success of our effort will depend upon our ability to visualize our own problem and to see it in its true perspective in relation to the life of the world.

From an economic point of view, human affairs at present rest upon two factors, both of which have an irresistible tendency to fatty degeneration through monopoly—the use of land and the use of money. Any study of any problem, be it the whole problem or the most infinite of its parts, which does not take cognizance of these two factors, is time wasted and effort thrown away. They are the prison wall, the unfathomable maze, the bewildering jungle, the waterless desert. The devil will point them out to us, if we will but walk to the top of the mountain with him, and the mockery of his laughter echoes wherever men meet and congregate, and, in solemn deliberation, refuse to begin at the beginning.

YET SLOWLY AND PAINFULLY man struggles on. Life is still an exciting adventure. Most men are not wilfully inhuman. More men would rather be honest than the reverse. Generosity springs like a flower whenever there is an appeal that can be seen or known or felt. The world is far from being barren of gentleness and kindness, from courage and devotion, from sacrifice and service. The struggle is sharp and the victories few. The way is easily lost, the road is often obscure, the dark is difficult to pierce. But until we have succeeded in creating an economic system under which men may practise Christianity, let us be tolerant of our fellow prisoners. Our shackles are alike, even though our offenses be different.

The architectural profession needs to be reorganized on new lines. As a body composed of a selected stratum or strata, it is without force and largely without a unified purpose. Rightly organized on the basis of tolerance and a will to make architecture a vital force in the life of the world, it would possess the power of developing a contribution of continually expanding service. As a disjointed profession, whether organized or unorganized, working under conditions which cause one part of the profession to scoff and jeer at the other part, it cancels its own effort even before the effort is made. The professional problem throughout the world partakes of this universal weakness, and is subject to the same fatal malady. Individuals are working alone; organizations are working alone; countries are working alone. It is all solitary and, for the most part, unrelated effort. There is no visible unity of purpose. No one organization helps another. Each plays its own little drama apparently in complete ignorance of the fact that there are several other interesting theaters where the performance might be both useful and instructive. The time has come to throw away this passion for monachism. If the architectural profession is to become a force for good in the life of the world, it must develop its local organizations more fully, weld them into its larger organizations more completely, and then merge the whole into an international fraternity of purpose and thought and activity such as will compel, through the sheer force of meritorious contribution, the respect not only of peoples but of all those in authority. But that contribution, to be meritorious, must continually point the way toward a finer humanity, a more equal justice, a world neighborliness based on the law of live and let live. Nothing short of this will do. If this be the goal, the race is won even before the start is made.

The Competition for the Federal Buildings, 1792-1793

By FISKE KIMBALL and WELLS BENNETT

II

THE narrative of events in the competition for the federal buildings, so often written, still greatly needs to be summarized anew, in view of freshly discovered evidence which has an important bearing.

The first suggestion of holding a competition came from Jefferson, then Secretary of State, in a memorandum of September 8, 1791.[1] He was influenced doubtless by his knowledge of the practice of securing designs for public buildings by competition in France. His original "sketch or specimen of advertisement" of the Capitol competition, which accompanied the suggestion, and which has escaped previous searches, has now been found,[2] and shows that the official program for the Capitol as well as that for the President's House was essentially his work. The first draught, here quoted, reveals the tentative state of the plans for the new capital city, which had not yet even received its name, but the draught already contained all the important provisions of the published version frequently reprinted.

"Plan of an Advertisement

A Premium

of 500. dollars, or a Medal of that value at the option of the party, will be given by the Commissioners of the federal buildings to the person who before the day of 179 shall produce to them the most approved plan for a Capitol to be erected in the chief city of the Fed. territory: the building to be of Brick, and to contain the following apartments, to wit:

a Conference room } sufficient to accommodate 300 persons each
a room for the Representatives } sufficient to accommodate 300 persons each
a Lobby or Antichamber to the latter.
a Senate room of 1200 square feet area.
an Antichamber or Lobby to the last.——
} these rooms to be of full elevation

12 rooms of 600 square feet area each, for committee rooms & clerk's offices, to be of half the elevation of the former. Drawings will be expected of the ground plats, elevations of each front, and sections through the building in such directions as may be necessary to explain the internal structure; and an estimate of the Cubic feet of brickwork composing the whole mass of the walls."

[1] Library of Congress, "Washington Papers," Sparks Index Series, vol. 74, p. 409.

[2] Department of State, "District of Columbia Papers," vol. 6, p 88. Cf. also the copy at p. 140.

It was this very draught, we now see, which Commissioner Johnson sent back to the President and which was then once more, on March 6, 1792, sent to the Commissioners with some corrections.[1] These corrections, interlined by Jefferson in the draught, introduce the name of the city "Washington in the territory of Columbia," suggest July 20, 1792 as the time limit, and, besides providing that the Commissioners give the first prize for the best plan "if adopted by them," introduces a second prize of equal value otherwise. The Commissioners themselves made no further changes except to advance the final date to July 15 and to modify the amount of the prizes. These became, for the first prize, a lot in the city, with $500 or a medal; and for the second prize, $250 or a medal.

The program for the President's House was also sent to the Commissioners on March 6. The original draught[2] which has likewise hitherto eluded search, shows a suggestion from Washington to Jefferson which is interesting to note. Jefferson first wrote:

"A Premium

of 500 dollars, or medal of that value, at the option of the party will be given by the Commissioners of the federal buildings to the person who before the day of next shall produce to them the most approved plan of a President's house to be erected in the city of Washington and territory of Columbia. The destination of the building will point out to the Artist the number, size and distribution of the apartments. It will be a recommendation of any plan that the central part of it may be detached and erected for the present, with the appearance of a complete whole, and be capable of receiving the additional parts in future if they shall be wanting."

Washington wrote at the bottom:

"I see nothing wanting but to fill the blanks—and that I presume the Comrs will do—unless, after the words "destination of the building" is added "and situation of the ground" for I think particular situation wd require partr kind or shaped buildings."

This suggestion Jefferson incorporated before sending on his draught, to which he also added provisions for drawings and estimates as in the Capitol program. The final advertisement[3] followed it with negligible changes.

Under these programs, designs for the Capitol were received from Philip Hart and Abram Faw before June sixth,[1] from Samuel McIntire on July second,[2] from Stephen Hallet before July 11,[3] and from Jacob Small, James Diamond, Samuel Dobie, Robert G. Lanphier, Charles Wintersmith, and Andrew Mayfield Carshore also at some time before the judgment by Washington and the Commissioners at Georgetown on July 16 and 17. Designs for the President's House were submitted before that time by James Hoban, Stephen Hallet,[4] John Collins, Collen Williamson,[5] Philip Hart, Andrew M. Carshore, Jacob Small, James Diamond, and, anonymously, Thomas Jefferson himself.[6] Hoban's design for the President's House was awarded the first premium by the Commissioners; that of John Collins "appearing to be scientific and second in merit which had been laid before them, they directed the payment of $150 to Mr. Collins as a token of their sense of the merits of his essay."[7] Regarding the designs for the Capitol the Commissioners wrote Hallet the same day,[8] "neither of them has met with entire approbation," although Lanphier's was considered, and Hallet's (A), which followed a suggestion of Jefferson, was most favored.[9]

The formal competition being over, the Commissioners, in their letter to Hallet just cited, invited him—as author of the design "approaching nearest to the leading ideas of the President and the Commissioners"—to come to Georgetown and study the matter further under their direction, with a liberal guarantee of expenses and the possibility that his design might be "improved into approbation." A design from Judge George Turner, apparently incomplete, which arrived the day after, was also favorably regarded,[10] however, and Turner was asked to send "any additions you may have ready."[11] Revised designs by Hallet (A′) and Turner, with

[1]Department of State, "District of Columbia Papers," vol. 6, pt. 2.
[2]"Letters of the Commissioners," vol. 1, p. 74.
[3]Printed in Kimball: "Thomas Jefferson, Architect," pp. 154–155.

[1]Office of Public Buildings and Grounds, "Letters Received by the Commissioners," p. 94, vol. 1.
[2]*Ib.*, p. 98.
[3]*Ib.*, p. 101
[4]*Ib.*, *id.*
[5]*Ib.*, p. 116, vol. 2.
[6]Kimball: "Thomas Jefferson, Architect," pp. 154–156. The designs for which no reference is given above are either premiated designs, or ones, still preserved, the receipt of which is not specially mentioned in contemporary documents.
[7]Proceedings of the Commissioners, July 17, 1792, quoted by Bryan: "History of the National Capital," vol. 1, p. 195*n*.
[8]"Letters of the Commissioners," vol. 1, p. 104.
[9]Commissioners to Washington, July 19, 1792, "Letters of the Commissioners," vol. 1, p. 102.
[10]*Ib.*, *id.*
[11]Commissioners to Turner, July 19, 1792, *Ib.*, p. 103.

a belated design from Leonard Harbaugh and a "first study" by Samuel Blodget, Jr., which had been received meanwhile, were considered at a second, informal judgment on August 27, but again "none appeared so complete on the whole as to fix a decided opinion."[1] Hallet was thereupon given "a sketch of the internal arrangements" which the Commissioners thought most happy,[2] and requested by them to apply himself "to the Disposition intimated in the notes furnished to you;"[3] while Blodget was written giving further opportunity to submit "the plan you expect entering" and was sent a paper setting forth "the better matured ideas of the President and Commissioners."[4] Blodget does not appear to have presented a revised design, and the new one by Hallet (C), submitted in October,[5] which the Commissioners speak of as "drawn by our directions," proved satisfactory neither to them nor to himself. Nevertheless, the Commissioners wrote, "as everything he has exhibited, tho' not approved, has still exhibited more taste, and practical skill, than has appeared in any of the numerous ones with which we have been favored," he was employed to make still another design (D), receiving his directions from the President and Jefferson during a visit to Philadelphia.[6] This design Hallet presented on a second trip to Philadelphia late in January, 1793.[7]

Meanwhile a new competitor had appeared in Dr. William Thornton. He had written from Tortola in the West Indies on July 12, 1792,[8] stating that he had drawings ready and that he would bring them with him to America. Again, after his arrival, he wrote from Philadelphia, November 9,[9] that he would forward his plans if there had yet been no decision. The Commissioners requested that he would forward his plan for the Capitol to them before December 1,[10] but as he did not do so they asked him to lodge it with Jefferson in Philadelphia,[1] so that on the presentation of Hallet's, the President could have "an opportunity of judging of their comparative merits."[2] In the meantime, however, we see that Thornton must have undertaken another set—perhaps with oral supplementary advice such as had been given to Blodget and Hallet in writing—for as lending color to this supposition, Washington speaks of it on January 31 as still unfinished.

Even in this state it so impressed the President and others that Washington then practically decided the matter in its favor. In his letter of that day to the Commissioners, after recognizing that Hallet's plans (D) "undoubtedly have a great deal of merit," he says the qualities of Thornton's design "will, I doubt not, give it a preference in your eyes as it has done in mine," and adds "I have therefore thought it better to give the Doctor time to finish his plan, and for this purpose to delay till your next meeting a final decision." Jefferson's letter of the day following, also, although saying, "a just respect for the right of approbation in the Commissioners will prevent any final decision in the President till the plan shall be laid before you and be approved by you," speaks of the "interval of apparent doubt," which "may be improved in settling the mind of poor Hallet."[3]

Appreciating that his design was not wholly satisfactory, but not realizing that the issue had already been decided, over the heads of the Commissioners, by Washington and Jefferson, Hallet, after his return to Georgetown prepared and submitted to the Commissioners one more design (E)—"conforme aux données resultantes de la conférence que la President m'a accordée sous vos auspices," but this time embodied in forms chosen by himself.[4] The elevations and sections of this had not been produced when, early in March, Thornton arrived with his plan and a letter from Washington to the Commissioners reiterating that he had no doubt it would meet with their approbation.[5] Although evidently they did not wholly share the President's enthusiasm for it, since they raised cer-

[1]Commissioners to Blodget, August 29, 1792, *Ib.*, p. 111.
[2]Commissioners to Jefferson, October 14, 1792, *Ib.*, p. 69.
[3]Commissioners to Hallet, September 1, 1792, *Ib.*, p. 114,
[4]*Ib.*, p. 111.
[5]Hallet to Jefferson, September 21, 1792. Department of State, "District of Columbia Papers," vol. 1.
[6]Commissioners to Jefferson, October 14, 1792, cited above.
[7]Washington to the Commissioners, January 31, 1793, frequently published. That Hallet went personally to Philadelphia to submit this is proved by the phrase, "que J'ai produit dernièrement au President en votre presence," in his letter to Jefferson, March 13, 1793 ("District of Columbia Papers," vol. 2)—an important point, so we shall see, which has been previously overlooked, which supersedes the statement in Bennett: "Stephen Hallet," A. I. A. Journal, vol. 4, p. 382.
[8]"Letters Received by the Commissioners," vol. 2, p. 112.
[9]*Ib.*, p. 156.
[10]Commissioners to Thornton, November 15, 1792, Library of Congress, "Thornton Papers," vol. 1, p. 135.

[1]December 4, 1792. "Letters of the Commissioners," vol. 1, p. 125.
[2]Commissioners to Jefferson, *Ib.*, p. 127.
[3]Jefferson to Daniel Carroll, Library of Congress, "Jefferson Papers," Series 1, vol. 5, p. 22.
[4]Hallet to Jefferson, March 13, 1793, cited above.
[5]March 3, 1793, "Letters of the Commissioners," vol. 1, p. 117.

tain objections in their reply, they concluded "on the whole it gains our preference."[1] To Hallet they wrote, "Our opinion has preferred Doctor Thornton's plan and we expect the President to confirm our choice." Regarding compensation they stated that "neither the Doctor or yours can demand the Prize under the Strict terms of our Advertisement, but . . . the End having been answered we shall give the reward of 500 Dollars and a Lot to Dr. Thornton. You certainly rank next, and because your application was excited by particular request we have resolved to place you on the same footing as near as may be, that is to allow a compensation for everything to this time, £100 being the value of a Lot and 500 Dollars."[2] Still in ignorance that Thornton's plan already had the President's approval, Hallet informed the Commissioners of his intention of completing the design (E) on which he was engaged, "so that when the President shall come to join you you may be able to reach a final judgment."[3] At the same time he sent to Jefferson a description of this design to submit to the President, "asking him to suspend his judgment, if possible, until I have been able to place my work in a state that can be seen and understood."[4] All this was naturally unavailing under the circumstances, however, and on April 5 the Commissioners notified Thornton: "The President has given his formal approbation of your plan."[5]

Thus came to an end the informal competition which had resulted more or less accidentally since the close of the formal one. The successive designs made by Hallet while he was tentatively engaged by the Commissioners, embodying various suggestions from the authorities, had been compared with the competitive designs of others who did not complete or submit them until after the date specified in the program. One of these latter had been preferred by the President and the Secretary of State to those of Hallet's which they had seen; the Commissioners had somewhat dubiously concurred in this preference, and a sum equal to the original first premium had been awarded to its author, Doctor Thornton. An equal sum had been paid to Hallet to comprise both the amount of the second premium and a payment in compensation for his employment by the Commissioners.

In their conduct of the competition there can be no question that the public authorities were actuated by a sincere desire to act fairly to all parties, to the best of their understanding of such an unfamiliar matter. This appears especially in their dealings with Hallet, which involved nice questions of justice and tact. In summoning him to Georgetown to revise his first competitive design in the hope of its being approved, they stated, "at all events we shall liberally indemnify your expenses."[1] When they failed to approve his second design, yet asked him to continue his studies, they took pains to define their relations to him in writing. They stated their strong expectation of being able to form a lasting engagement, but their inability to do so with propriety until a design for the Capitol was officially fixed on. That they could scarcely do more, and that he could scarcely demand more under the circumstances, was recognized by Hallet himself. He writes, in his letter to Jefferson, March 13, 1793, "A stranger and almost unknown, I have no right to hope for confidence until time furnishes me the opportunity to justify it." In truth, although he had held high professional rank in France, he had neither the established reputation in America nor the means of bare livelihood which would have enabled him to require an assurance that he would receive the commission before he would continue his studies. That other men were also still allowed to submit designs in competition with his later ones was an inevitable outcome of the urgent need for securing some acceptable design as early as possible, and of the scarcity of designers at that time—now almost inconceivable to us—which threatened to leave the authorities wholly without resource if none of Hallet's designs should finally prove satisfactory. Hallet himself acknowledged that he had been honestly treated by the Commissioners, and only complained that the competition should be closed to the first design which was really his own.[2]

That it was so closed was hardly the fault of the Commissioners, for the final decision had really been taken out of their hands. The President and his advisers also are perhaps

[1] March 11, 1793, *Ib.*, p. 165.
[2] March, 13, 1793, *Ib.*, p. 171.
[3] March 13, 1793, Department of State, "District of Columbia Papers," vol. 2.
[4] Letter of the same date, cited above.
[5] "Letters of the Commissioners," vol. 1, p. 177. The "Proceedings of the Commissioners" for April 2 report the receipt of Washington's approval.

[1] July 17, 1792. "Letters of the Commissioners," vol. 1, p. 104.
[2] Letter of March 13, 1793 to Jefferson, already cited.

scarcely to be blamed for supposing, after Hallet had prepared four designs with the benefit of their advice, that they could expect little more from another effort on his part, and did not realize that he might make still better if left more free. Moreover they were again urged to haste by the long delay which had already ensued, and the positive necessity of getting the Capitol under way in order to establish confidence in the whole federal city project. That they were thus led to make their decision in favor of an unfinished design, which the Commissioners had not even seen, was a misfortune, however, quite irrespective of the merits or demerits of Thornton's original plan. The building of the Capitol was thereby burdened with a legacy of controversy, which has descended even to modern partisans of the various contestants.

Recognizing the force of circumstances which compelled the action of the authorities, and their uniform desire to act fairly according to the best principles of their own day, we may yet find interest in considering the competition also by modern professional standards. The program for the President's House left almost everything to the designers' judgment. The one for the Capitol, as the Commissioners themselves were led to recognize, "was drawn up without so full a consideration of the Room necessary as might have led the Ingenious to sufficiently specified objects"[1]—it was not specific as to practical functions and relationships, particularly regarding the conference room—naturally enough, in view of the novelty of the whole problem of a republican legislative building. The programs did not undertake that the commission to supervise each building should be awarded to the author of the best design submitted, although the Commissioners wrote that, should "the Draftsman of one or both . . . be desirous of conducting the execution," they would wish to engage him, "if proper in other respects."[2] The advertisement did not even undertake that the prizes should be awarded unless designs were adopted, although they proved to be awarded even, in the case of the Capitol, after the formal competition had proved a failure. The number and scales of the drawings required were not specified, and in fact many of the designs submitted were incomplete.

In the course of the competition also there were many things which we should today regard as highly irregular. Thus there was the submission of an anonymous design for the President's House by Jefferson, who had written the program and was consulted in the judgment, although he was not present at the final decision. This becomes explicable from his eagerness that some respectable academic design should be available, when one appreciates that the only designs laid before him and the President up to the eve of the judgment were those of Hart and Faw, of which Washington himself wrote, "if none more elegant than these should appear . . . the exhibition of architecture will be a very dull one indeed."[1] Jefferson also gave Hallet a suggestion for his competitive design for the Capitol, as we shall see, but no attempt was made to force the adoption of these inspired designs. A more serious matter was the opportunity, during the course of the informal competition, for the competitors to see each other's designs, giving rise to mutual charges of plagiarism which we shall have to discuss later.

In the main, however, the authorities, in spite of their inexperience, did conform tolerably well to the principles which govern good competitions today. In the case of the President's House they immediately awarded the prizes without favoritism, and engaged the winner to supervise the work. In the case of the Capitol, they selected the best designs from a competition to which all had been eligible, and gave their authors opportunity to submit modified studies on a revised program, impartially communicated. To the competitor whose first design was superior to the others, and from whom further successive re-studies were asked, they guaranteed and paid a suitable sum, in accordance with the uniform feeling, voiced by Washington, that he should be "liberally rewarded for the time and labors he has expended."[2] Thus although this first federal competition had the potentiality of abuses which later disgraced public competitions in this country, the integrity and tact of the authorities made it foreshadow in fact the best modern practice.

[1]Commissioners to Blodget, August 29, 1792, already cited.

[2]Commissioners to Jefferson, April 14, 1792, Department of State, "District of Columbia Papers," vol. 1, p. 95.

[1]Letter to David Stuart, July 9, 1792.

[2]Letter to the Commissioners, January 31, 1793.

(*To be continued*)

TOWN HALL — Osma

Soria, Osma and Cuenca

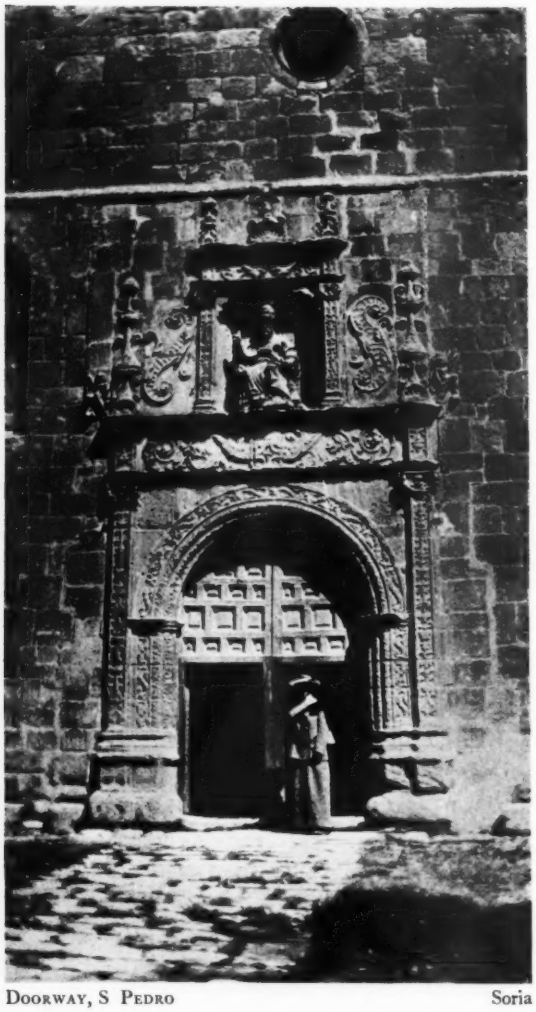
By GEORGIANA GODDARD KING
Photographs by E. H. LOWBER

SORIA is an odd place, full of marked types and ancient churches; only after a while does the traveller make out that it wants a cathedral and that he has been missing this. With red-roofed churches crowning red spurs of ocherous hill on every side, the town yet lies on a slope in two directions, inclined to the east but likewise to the south. The longer streets descend, gradually at first and then with a steeper pitch, to the bank and the bridge of the Douro. The Plaza Mayor is tipped sideways, on the right hand, against the High Street, and the elderly, not uncomely, buildings of the national and the municipal authorities sit uneasily in the dusty square; along another, parallel to it, stretches the sixteenth century palace of the Counts of Gomara, superb and shabby, where the post-office hides and the diligences come in.

At the same time, steep ways run up at the left to the long back of the hill northward. Climbing up the short and infrequent streets, past S. Tomas, without intervening suburbs you come upon open ground, for the walls and the Alcazar were destroyed by the guerrilla leader, Duran, in the War of Independence, to keep the French from profiting by them when he had to withdraw into the hills. In about five minutes more you top the crest and see the wide reaches of the upper plain, the land between Ebro and Douro. On the right, among the tawny miles, the river lies hidden in the broad valley it has dug for itself; on the left, to the edge of the vast river-basin, the mountains roll up like breakers on a lee shore, rank behind rank, to throw a faint, thin line of changing colours, lilac, sage-green, amethyst and periwinkle-blue. There the wind blows warm and aromatic from leagues of rosemary, juniper, and thyme. The evening lights burn there until the folding-star is lost among the swarming constellations.

In the middle distance lies the site of Numancia; in the foreground, the obelisk that commemorates 1812.

The Sorians, though not always a fortunate, have been a free people from the Iberian time. Though the town was small, they protested to



DOORWAY, S PEDRO Soria

Alfonso X against his fond and vain ambition to become emperor and king of the Romans. In the Communal rising they played a good part, and to the immortal praise of the bishop it must be recalled that though he girt on armour and a heavy sword and led the loyalist troops in putting it down, yet in the day of victory he prevented the emperor's soldiery from sacking Valladolid, as, for the same emperor, those under the Constable of Bourbon were to sack Rome. When Soria submitted like the other towns, the prime rebels were safely out of the way, and in a few months the official lists of the revolutionaries were found to be missing, between one notary and another to have been mislaid and lost. In time long past the citizens, doubtless, had learned how to play off dog against wolf and lion against both, and keep a whole skin, for the land lay in the midst, between the kingdoms of Aragon, Navarre and Castile, and was held by whomsoever could hold it; so the bishops of the See, which is called of Osma, had to guard all ways at once, against the bishops of Burgos, Tarragona and Siguenza, the abbots of Arlanza and S. Domingo de Silos, S. Millan and Huerta.

Alfonso of Aragon, el Batallador, is known to have held Soria, and to have taken it as deserted, untenable by Moors and unsafe for Christians. He put his own men there, but, though the Templars were probably of these, there remains no building which can be referred to his time. Alfonso VII, his stepson, recovered it for Castile. Here, for the sake of security, the infant king, Alfonso VIII, was brought up in one of the great houses; the leaders and lords of Lara, that had charge of him, set the house of S. Cruz to be his guard, and when his wicked uncle, Ferdinand of Leon, came seeking the young child, they played a good game. When the king claimed to see his royal nephew, either the bright armour or the wicked eyes so frightened the baby that he clung to his guardian's neck, and at last was carried off screaming for bread-and-milk and bed. Then a swift horseman carried him to the Castle of S. Esteban, and thence, among the scattered hills, across the dusty leagues, to Gormaz, and so, by an armed hide-and-seek, kept him in safety, and King Ferdinand went home as he came. Alfonso, in 1170, when at fourteen years he attained his majority, dowered and enriched the town with what seems a real affection, and to his fostering, in the close of the twelfth century, must be referred the inception of all the great works that still remain.

The city, that counted once, besides convents and chapels, thirty-seven parish churches, keeps still, among others, four curious churches as unlike as possible, more diverse in origin than in age. Two of these are dedicated to S. John, one to S. Tomas and one to S. Peter enthroned.

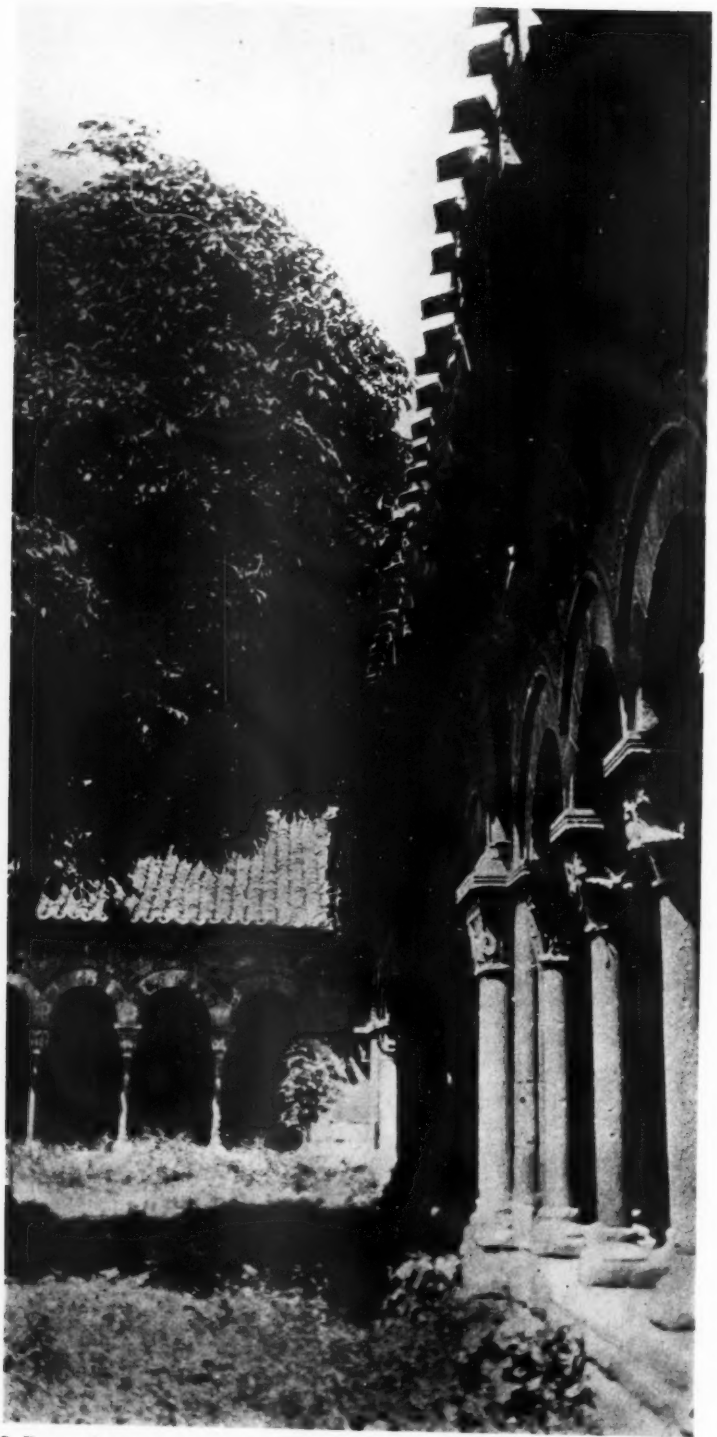
S. Juan del Duero belonged to the Knights of the Hospital, S. Polo, close by, to the Temple, and the hospice and chapel of S. Lazarus completed the group that kept the bridgehead and dealt with all comers, strolling soldiers and tramping pilgrims, for the safety of the city,

Now, three heaps of formless buildings stand in green meadows and beside the best of these, a roofless cloister. Like the cloister once, the little church of S. Juan is timber-roofed; the apse has pointed barrel vault and semidome, and on either side of this, over altars against the eastern wall, stand two strange little massive tabernacles, that look like chapels. In Ravenna, at S. Apolinare, the Ciborium of S. Eleucadius occupies the same place. The roof of one rises above the fabric in such a bubble or half-orange as the vaults of S. Giovanni degli Eremiti in Palermo; that of the other in a sort of cone, surprising and Asiatic. The eight capitals, which deal with fabulous monsters and Scriptural history, especially with the massacre of the Innocents, are the only ornaments in the church: they were probably determined by the carvings at S. Tomas, though not by the same hand. In the cloister, the capitals range from strap work and net, to lovely gothic sprays of cress, a few historied. Their themes are appropriate, the Marys at the Sepulchre, or the sheep, the wolf and the shepherd. The corners, cut off, are pierced with horseshoe arches, except that next the church door. About half the arcade is composed of very ugly interlacing arches, that recall the Amalfitan style; the rest partly of round arches, and partly of pointed or pointed horseshoe form. Mudejar elements might be looked for in Soria, where the *aljama*, or Moors' Ghetto, was one of the most important in Castile, but the tabernacles within, and the arches without, are closer to Italy than is anything else in Spain. The church, untidy and neglected, the cloister, unroofed and disused, standing amidst rank grass inside a blank wall—the scene is forlorn as a child left to the care of servants.

The most unexpected church, however, is the oldest, S. Tomas; built in the end of the twelfth century by workmen from south-western France, many a parallel may be found to its double arcade along the road by which pilgrims came into Spain, at Pons and Plassac and Aubeterre and throughout the departements of Vienne, Charente, and Charente-Inférieure. An intricate cross crowns the wide slope of the gable, nowhere broken; the central portion is adorned with a rose or wheel-window of eight rays, set in a circle of such fantastic monsters as occur at Troja above the Adriatic

S. Pedro Soria

and at Cambre above the Atlantic. Below, the entire bay of portal, set a trifle forward, carries in the spandrel space—as at Verona and Toulouse—two reliefs of prophets. One of these sits under tabernacle work, the other under a pattern of cut-out discs, overlapping, that recurs in the head of the arcade-arches and also on the ruined church of S. Nicholas, and that I do not remember to have seen elsewhere. The prophets are Enoch and Elias, gate-wards of Paradise. The archivolts below tell of Christ, in this world and in eternity, and the tympanum is an apocalyptic manifestation of the Trinity. In short, the carving is rather nondescript in intention, and quite confused in style; the heads in the tympanum recall S.



S. Pedro Cloister — Soria

S. Juan del Duero

Soria

APSE, S. JUAN DE RABANEYRA Soria

Miguel of Estella; the capitals of the jamb-shafts and the two arcades continue the strong Franco-Hispanic tradition that reappears at S. Pedro; but the little figures in the upper rows of the archivolts have an indescribably oriental aspect, the Madonna in the Epiphany being fairly Greco-Buddist, like a very lovely young Siddhartha. The church within has been ruined by rebuilding at least once, but the style may be recognized for Poitevin, with three lofty parallel barrel vaults, carried on arches, in the two western bays; it is now given over to a restoration of the most thorough kind.

To justify the existence of restorers, S. Juan de Rabaneyra, which was dug out of encasing plaster as late as 1908, exists. They revealed a choice piece of twelfth-century Romanesque with parallel apses, a dome on squinches, the pointed barrel vault of the presbytery sustained by diagonal ribs, and the chevet with its continuous substance fluted or rather pleated up into the semblances of ribs. It would seem from pictures that the church of Jazeneuil (Vienne) offers a prototype as a parallel. Two statues of the school of Toulouse are now built into the retro-choir, and the design of their arcade, composed with triangle, disc and scallop, I recall seeing only at S. Eutropes of Saintes and S. Antimo in southern Tuscany, a bit of Cluniac building.

The conclusion of the whole matter is, probably, that Alfonso VIII took builders where he could get them: Angevine, indeed, for Las Huelgas and Cuenca from the domains of his English queen, and Cistercians by the same token, but for Soria, Poitevins, less expert, less up to date, still Romanesque, and possibly with them a monk of Cluny; hired men from the great *chantier* at Estella and possibly from the great abbey of S. Juan de la Pena, in Aragon, for there are parallels in the capitals; borrowed as well, perhaps, from the Templars down by the river, for what I have called the Greco-Buddhist element will not be ignored. At least three men, or groups of men, worked at S. Tomas, and how the carving was done in little clumps and then set in place, is easy yet to see. If S. Tomas was the first great work of the *chantier* of Soria, then S. Juan del Duero imitated, and worked along for a couple of centuries; S. Juan de Rabaneyra shows the beginning of the transitional style; finally, lasting through the whole epoch, the cloister of S. Pedro.

That is one of the strongest and most splendid of its kind in Spain, all of a piece, timber-roofed, arcaded on coupled shafts, and sumptuously carved in the capitals, now with saintly legends, again with monsters, possibly the freshest and most life-like being those of the centaur and stag; often with strong fleshy leaves; or a pampas-grass. In places S. Pedro la Rua at Estella is imitated; again appear two lions with their heads between their feet, or a pair of dragons coiling up the capital and down again; cheek by jowl, these reappear at S. Andres de Armentia, near Vitoria. A collegiate church of Augustinians, S. Pedro should have been the cathedral and Soria the See; Alfonso VIII actually secured the bull from Clement IV, and Bishop Augustine, in the thirteenth century, would have approved the translation. Osma, however, was stubborn and in the sixteenth century, the chapter gave up the struggle and

rebuilt in the noble late style which is so strong and high, so friendly, so satisfying in airy amplitude. "Enel año de 1577 se acabo de reedificar esta iglesa en el dia de San Pedro de la Catedra, habiendo mas de ochocientos anos que era Iglesia," says an inscription; the church already counted eight hundred years.

The See of Soria, then, which was Osma, lay away from the river and the road, and the cathedral stands in Burgo de Osma, a mile or so farther up stream, and five miles from the railway station on the old highway. Just as, if he had come down to Soria from Burgos by diligences, the traveller would have been aware of passing through the scenery of the Infants of Lara, so in going due westward from Soria he has been roused for some hours into a kind of familiarity with the landscape and the place-names, and realized at last that this wide yellow world, in which lone, rain-washed hills rise up to sustain a single tower, or a castle still perfect, or a forgotten town, is the scene of the Poem of the Cid. Here is Gormaz, yonder S. Esteban, somewhere hereabouts should lie the oak-wood of Corpes. From the railway station a narrower defile, guarded each side, on the cliffs of clay by ruined towers, takes him up, following a green stream, to the bridge and valley mouth of what was Uxama before it came to be Osma; lastly, to the cathedral town, lost there among the arid hills and found, strange and sudden as places are in dreams.

Aloof and perfect, except that the walls are gone, it is like a city under enchantment. The single long street winds from a palace to a cathedral, under its *soportales*, like Bologna or Mantua: the people are courteous and not visibly curious. There the chemist's shop lights up, at night, its painted porcelain drug-pots; the ruddy hams and sausages dangle, the green figs, cabbages and salads lie in soft piles; blue alpargatas and brown corduroys swirl and swing, the wine-skins smell of must, resin, and goat, like an old clown's jokes. In the inn you expect to hear Dr. Smollet grumbling, and calling for wine in bottles and bread made with yeast, both being unprocurable; in the square you expect to have Lazarillo, after begging, insult you adroitly; but no, the place lies under a spell and all the semblances of life go on as unaware of the spectator. Furthermore, the beds are as clean, the townspeople as kind and eager as though it were Italy; and the cathedral, when reached, looks as fair and almost as pure as though it were France.

S. Juan de Rabaneyra — Soria

By successive French bishops, indeed, was built the first cathedral after the Reconquest, and the first and the second of these had come into Spain with the mighty Bernard of Toledo; it was Romanesque, and of it survives only the chapter-room, and some doors into the sixteenth century cloister that alternate with others in the most gracious plateresque. In the *élan* of the great building age, Bishop Juan Dominguez, the chancellor of S. Ferdinand, who had been abbot at Valladolid and was to be Bishop in Burgos, rebuilt the church, beginning in 1230, just ten years after Bishop Maurice laid the first stone at Burgos. He had the command of such workmen as commenced Burgos and carried on

DETAIL OF ARCHIVOLTS, S. TOMAS Soria

at Leon, but whereas the detail of the capital and moulding at Burgos is nearer to Angevine, the figures about the transept portal at Osma are directly of the school of Rheims, and as late as the latest on the façade there. Within, the nave has five bays of cross-vault with the original shallow aisle-chapels, strong transepts, an eastern aisle thereto, and three apses. These possibly were five before the eighteenth century turned an ambulatory and threw out a circular chapel for the Venerable Juan de Palafox, finished in 1781, which is ludicrously like in intention and unlike in effect to Becket's Crown at Canterbury. But the rest is perfect: the clerestory windows, like those of Chartres, have no tracery, but a pair of wide lights set under a roundel in five broad lines, and in the chevet a single lancet to each bay. The banding and leafage are exquisite in proportion and in the grace of nothing-too-much. The vistas have, compared with those loftier in France, a special and serene charm. It is the flowering of the thirteenth century, noble and luxuriant, like a fair queen who can trust her soul to keep her beauty.

In the north stands the tomb of the first bishop, S. Pedro de Osma, carved with the miracles he worked, where the poor are crowding around his very body; the style is contemporary with this church. The old chapter-room, vaulted on four pillars with storied capitals and wall-brackets, belongs to the earlier transept, and the Innocents are massacred by the same soldiery as at S. Tomas and S. Juan in Soria: it opens to the north from beneath the sumptuous Renaissance chapel of the saint, as the cusped roses open in the transept face above it; and the chapel, and the cloisters with their rich and intricate traceries, and the rebuilding of the south transept portal, are all about contemporary.

The western doorway is cramped between chapels, and though place is prepared for jamb-statues after the French manner, none remain there, but arcades, set thick with leafage in the spandrels, above and below. Like the leafage, the statuettes in the archivolts look to be of the fourteenth century, so also the leafage of a small door in the south flank; but the door from the north aisle into the cloisters recalls the work at Las Huelgas in the cloister of S. Ferdinand. Perhaps for want of funds, the sixteenth century did little real harm at the great transept door, beyond clearing out of the tympanum all but the lowest row of statues. These represent the Dormition with the twelve apostles. The six jamb figures are not quite alike, nor of equal

merit. The young king, beardless, who holds his sword in sheath and the strings of it wrapped about and fastened, in the touching and not unfamiliar image of those who seek peace and ensue it, is rather heavy; Solomon and Sheba are handsome creatures, the one properly coquettish, the other uxorious. But on the opposite side, Moses and the Angel, and the Virgin Annunciate, are as magnificent as they are Rémois, and far ahead of the door to Burgos cloister; liker, in truth, to the statues in the same place at Leon, and French not at second hand nor at fifth, but French from the chisel of another Villard d' Honnecourt.

An elder sister of Osma is Cuenca. Of S. Ferdinand's cathedrals, Osma comes closest to the pure cold Angevine style of Las Huelgas and Cuenca. On that high-lying cathedral, far off in New Castile, Queen Eleanor set for a sign her English hand, in the exquisite early-pointing of the arches and mouldings, the columns shafted and banded, the delicate *chapiteaux a crochets*, the tall English lancets of the transept so ill suited to the Spanish sky that they are built up in solid masonry, have been so always, and shall so remain. Alfonso VIII, having conquered the city, founded there a cathedral, says the *Coronica General;* the edifice boasts a most amazing lantern, also in the lancet style, cut off from the crossing in a way to which Spain offers parallels at S. Cruz de la Seros and in Mudejar building at Almazán near Soria. The fifteenth century has built a florid ambulatory with double aisles modelled on that of Toledo, but the pure and early part shows, eastward of the crossing, a double-aisled effect which was to continue indeed either in such an ambulatory, or else as an experiment in successive chapels opening up the eastern vista as at Soissons and S. Yved of Braisne, and perhaps at Southwell Minster. With the west front under restoration, the unspoiled nave blocked up; with all the sixteenth century splendor of forged *rejas* and carved doors and plateresque stone sculpture; with the deep cramoisy and rich blue of Ferrando Yañez's most Raphaelesque retables burning like obscure rubies in the transept chapels' dim profound, the cathedral of Cuenca continues, notwithstanding, to look somehow English. Outside, the effect is equally northern, and insular, with the long choir roof and the want of flying buttresses.

Peasant of Soria

The old town of Cuenca rears its unvailed crest at the junction of rivers, like something in Auvergne or the Vosges, against a background of wooded mountain, piled high on purple steepy rocks above tall cliffs, the houses clinging to the sides of it like mudswallows, and above the town you may still climb and continue till you have pushed far into the Sierra. The steep streets are clean, clattering to donkeys' feet, and between the rare passers, the roar of the creek comes up, and the rustle of the green boughs far below. By sharp and devious paths you may breast the rusty cliff, and enter under a barbican where the wallflower and the snapdragon are nodding above the incumbent ivy-tod; or slip and recover, not once, but many times down a stony declivity to where thin poplars offer the mockery of shade to washerwomen in the river-shallows. In the wider valley, where the united streams run westward fast to the Tagus, you may buy green and purple figs, oozing sugar, and a green and olive earthenware, as perishable as it is graceful, and book for the diligence, and lodge cleanly. But all night long the trees by the river talk together in the mountain airs, and the stream is loud in the dark; and the long roof and square tower of the cathedral, that sailed among the clouds in the blue, are visited all night by troops of stars.

Spirit of Gothic Architecture — Page with Coat of Arms of University of Chicago — Alma Mater

Youth — The Lake and the Woods — The Moon — Golden Sun Chariot

Spirit of Worship — Knowledge — The City

THE MASQUE OF YOUTH — Mural Paintings by Mrs. Jessie Arms Botke

Commemorating the Dedication of Ida Noyes Hall, University of Chicago

PIERROT

After a Lithograph by Ethel Gabain

The Problem of Rebuilding the Devastated Regions of France

By JEAN-PAUL ALAUX

NEVER before, within the memory of recorded history, has any country inherited a problem so difficult as that which has fallen to France as a result of four years of war. If one could visualize the ruins of San Francisco immediately after the earthquake, and then multiply this vision by hundreds, one might gain a limited idea of what has happened in the north of France. It is not only a problem of restoring numerous important towns and cities, but also there must be rebuilt several thousand villages, many of which were among the most charming we possessed.

Some of these villages, such, for example, as Ablain St. Nazaire, of which I have already written in the Journal, possessed churches which were classed among the *monuments historiques*, as well as other buildings which constituted a precious memory of the past. All of these have disappeared forever.

Among the more important towns which may be considered as utterly ruined there are the following: Arras, Soissons, Reims, Verdun, St. Quentin, Lens. Among those which have been seriously mutilated there are Amiens, Dunkerque, Douai, Compiégne, and Lille. In the list of smaller towns which have been completely ruined there may be mentioned Roye, Lassigny, Chaulnes, Montdidier, Ham, Bapaume, Peronne and Nesles. In this same class the towns in which the destruction has been great, but not complete, there are Noyon, Rethel, Vouziers, Cambrai, Bethune, Chaulny, La Fere, Pont à Mousson, and Château-Thierry, and this list might be considerably extended.

In Reims, before the war, there were 14,000 houses. Of these, 12,000 have been destroyed, and scarcely one of the remaining 2,000 has escaped serious injury. Of the villages, thousands have been so completely wiped out by the war that it will be practically impossible for some of them ever to find again any trace of either the houses or streets which once marked their sites. At Lens, for example, it is utterly impossible to trace a single vestige of the town. One can only hazard a guess as to where the church was located, and the destruction is so complete that one feels himself in the presence of a result which was obtained only by the organization of a deliberate demolition, planned to accomplish the utter destruction of a whole town, leaving no vestige or trace of the centuries through which it had passed.

At Souchez, of which no fragment remains, the little river itself has become lost in the innumerable shell-holes of the region, and the site of the town has become a swamp. I speak of these districts where I was quartered as a soldier, and where I have, with my own eyes, witnessed the disaster which has befallen these once prosperous regions. Many of these villages, unhappy as may be the thought, have no doubt disappeared forever from the map of France; either their one-time inhabitants will never return in sufficient numbers to make it worth while to attempt a reconstruction, or, in other cases, it will be far more desirable and far less costly to build new villages on neighboring locations and thus avoid the almost incalculable cost of restoring any semblance of order to the ruin which now encumbers the former sites.

A further difficulty presents itself in relation to property boundaries. All traces of these have, in many cases, been completely lost. The only clue left is the Cadastre plan which rests in the archives of Paris, but this is on a very small scale, and it is known to have been incorrect at the time the war broke. Further to complicate this question, it is only necessary to record the fact that all records of titles kept by notaries or by the city authorities have been destroyed along with the buildings which contained them; the archives of all these towns and villages are gone forever. It must also be remembered that for four years many of the inhabitants of these wounded and ravaged towns and villages have been dispersed, not only throughout France but also in Germany and the neutral countries. The whereabouts of many is unknown, and to all intents and purposes they have vanished along with the homes in which they lived.

On the other hand, a certain number of these refugees have made one effort after another, ever since the outbreak of war, to return to their homes. With that tenacity of purpose which is perhaps one of the prime qualities of French character, they have reorganized their little villages, made habitable those houses left standing, and endeavored to pursue their agricultural work. In these efforts they have been admirably aided both by the American Red Cross and by the initiative of individual Americans. Gradually, and with the most painful of efforts and a sublime resignation, they have gathered together a few cattle, obtained seed for cultivation, distributed food and clothing and endeavored, not only to sustain themselves but to make a contribution to the sustenance of France.

Unhappily, the German offensive in March, 1918, obliged all of these courageous inhabitants to abandon their makeshift habitations (some of them for the third time)! Imagine with what sacrifice these patient people demolished and burned the temporary homes which they had built among the ruins, destroying as well all their stock of food, clothing, and material which could not be carried away. The business of war demanded that nothing useful should fall into the hands of the enemy, and certainly this ghastly tragedy of the twentieth century records few things more pitiful than the abandonment of these heroic efforts by the refugees.

On the signing of the armistice it became possible to think about permanent restoration, but in order to begin the rebuilding of these destroyed towns and villages, it will be necessary to build large temporary communities where not only the workmen employed may be housed and fed but where the returned inhabitants may be quartered as well, since it is recognized that they will wish to be consulted in the rebuilding of their homes while they carry on as best they can their regular occupations.

Thus, to carry out this work it will be necessary to organize great central depots for materials, huge workshops for the plumbers, carpenters, painters, and other trades, and, in a word, create a great artificial community with an artificial life in order that the permanent community may be reborn. It is easy to understand that such a work will be long and that it will encounter difficulties which cannot be foreseen. How, to put it briefly, can the work of many centuries be compressed into a few years?

Perhaps the difficulties at present foreseen might be enumerated in the following order as suggestive of the degree of their importance:

1. In order to carry away their plunder, the Germans took possession of every kind of vehicle; as a consequence, there is at present a serious crisis in transportation. For months it will be extremely difficult to distribute provisions in the devastated regions; it will be impossible to transport materials in anything like a sufficient quantity. All possible means of transportation will be required in order to prevent the present population from dying of hunger.

2. The towns and villages being for the most part utterly ruined, it is impossible for workmen to be sent there. No housing of any kind exists and, as I have before stated, vast temporary communities must be built before any effort can be made toward permanent restoration.

3. Slowly but surely the one-time inhabitants will wish to return, and it is in the common interest that they should return in as great numbers as possible, but this again involves a colossal problem of temporary housing.

4. For the restoration of the economic and industrial life in the north of France, it is imperative that the workshops and factories be rebuilt without delay. This can be accomplished only with the aid of money supplied by the Government; but manufacturers must know under what conditions this money will be obtainable. For example, if in accepting Government funds will they be obliged to rebuild their works in the same place and for the same purpose, or if they may use their money to build on new sites or for new purposes? The general destruction has completely changed industrial and economic conditions, and this fundamental problem must be studied anew. It is hoped that the question will be dealt with very shortly by the Chambre des Deputés. At the moment of writing, no manufacturer in the north of France knows the conditions under which he may begin the rebuilding of his industry.

Thus in summing up a problem so colossal and so complex, one may gather an idea of the extent of the organization which will be demanded. We are at work energetically in France on this question, and, in spite of certain indecisions, we hope that the winter will not

have passed without producing a definite plan of reconstruction established upon a sound base. The United States, which has so generously and so powerfully come to the aid of France during the war, can render even a greater service during the period of this immense undertaking of restoration. Thus, it is with the greatest pleasure that we have received the offer of the American Institute of Architects, placing at the disposition of their confrères in France such service as they may be capable of rendering and which may be useful. Immediately upon learning of this offer, I took pains to discuss the matter with my fellow architects in Paris, and in a purely informal manner I might say that the help which seems most urgent at the moment may be enumerated roughly as follows:

1. Could the United States ship us quickly, quantities of "knock-down" wooden houses?

2. Would it be possible to furnish ready-made materials in large quantities, such as doors, windows, glass, hardware, bricks, and tiles, paints, electrical material, plumbing and sanitary apparatus?

3. Would it be possible to mobilize or assemble this material in such manner that shipments could be made of rooms complete—sleeping chambers, kitchens, dining-rooms, offices, and a complete equipment also for barns and stables?

These are purely informal suggestions based upon the discussions to which I have alluded. As soon as possible we may be able to offer suggestions of a more definite character, and very shortly I hope to be able to send to you a complete analysis of the administrative organization which will deal with the whole great problem of rebuilding and restoring those once prosperous areas in the north of France.

Announcement Regarding the Fifty-second Annual Convention

NASHVILLE, TENN., APRIL 30, MAY 1 AND 2, 1919

The principal business of the convention will be the consideration of the report of the Post-War Committee on Architectural Practice and the effecting of such action as shall be best calculated to accomplish the vitally necessary results.

All chapters of the Institute, and architects individually, are urged to consider earnestly the preliminary report of the committee as printed in the January issue of the Journal, and any further communications that may be addressed to them by the Post-War Committee, so that they may be prepared at the convention to assist in its work with constructive suggestions.

This is a matter not merely of the Institute, but of the entire profession, and challenges the most thoughtful consideration. It lays an insistent demand upon the Institute which can only be met fully by each member taking upon himself his full share of the burden of responsibility.

Because of the important work of the Post-War Committee, as well as the desirable expansion of the Institute's efforts in other directions, the Board of Directors has found that the estimated expenses required for the work of the Institute during 1919 will exceed by more than $10,000 the total estimated income for 1919.

The Board resolved, at its November meeting, that the budget then approved by it be submitted to the convention for approval as outlining a plan of action which the Board believed to be not only desirable, but necessary; and it further resolved that the membership be notified that a most serious interference with the post-war program will result if the convention does not approve the expenditures provided for in the budget.

With a view to meeting the demands of the budget, and with a conviction that the reserve fund was created to meet just such an emergency as now faces the Institute, the Board directed that due notice be given, and in compliance with the provisions of Article V, Section 5 of the By-laws such notice is hereby given, that authority will be requested of the Fifty-second Convention to expend out of the reserve fund the sum of $10,000 or such other sum as the convention may determine, for the purposes of the Post-War Committee and such other extraordinary activities of the coming year as may be designated by the convention.

WILLIAM STANLEY PARKER,
Secretary.

Post-War Committee on Architectural Practice

MEETING, NEW YORK CHAPTER, FEBRUARY 18, 1919

THE meeting was announced as being intended to discuss items F, "The Architect as a Citizen," G, "The Contractor's Function," and H, "Advertising."

There was a fairly good attendance and the discussion was very animated. A number of papers previously prepared were read. Aside from one member who wrote a letter saying that, in his opinion, the whole inquiry was purposeless, every speaker or writer made a positive contribution to the subjects under discussion.

Under the heading, "The Architect as a Citizen," it was very generally agreed that it would be greatly to the advantage of the architect himself if he were to participate more largely in public affairs; it was urged that this should be, not in order to give the public a better idea of his functions and ability, but because of the duty which the architects owed to the community in which they lived. One writer said that the architect seems to be slow in taking up public questions as if he were fearful that his motives might be misconstrued and that some one might accuse him of merely looking for jobs. He also said that architects seemed to be more thin-skinned in this respect than were the doctors and lawyers. Every speaker insisted that the main purpose of such participation on the part of the architect in the discussion of public questions and the announcement of the joint opinion of groups of architects on public questions was in order to advance the public welfare and not in order to increase their own prestige.

The Status of the Contractor

Under the second heading, that of the "Status of the Contractor," there was a most animated discussion lasting an hour and a half, in which almost every one participated. Aside from the familiar points so commonly raised in similar discussions in the past, the following comments are to a more or less degree novel: One speaker said that when the contractor works on a cost plus basis, he is becoming a professional man in more senses than one. He claims the privileges of the professional man, that is to say, he tries to shift responsibility for errors! Then again, it was explained that more and more contractors today are nothing more than brokers working with their subcontractors' funds without any skill themselves as builders. In other words, whereas a few large, capable concerns have appeared in the foreground, there is a very large number of incompetent general contractors who have not one single qualification and are neither specialists nor qualified to supervise construction. In general, the point was made that a curious separation has grown up between the builder and the architect—a separation that did not exist in the days when architecture was a great art. Another speaker called attention to the fact that unless a line between the functions of the builder and the architect is clearly defined, the architect is assumed to carry even an incompetent builder through a job through his (the architect's) structural knowledge, and thus he encourages the incompetence of the builder; and again it was said that one reason why the big contracting concern is coming to the fore for big operations is because it is so frequently able to render financial assistance to carry the job through to completion, either by taking bonds or stock itself or passing it on through its organization into the subcontractors' hands. Of the least competent class of general contractors who are thus engaged in what was called the favorite American habit of "passing the buck" it was also said that they really use their subcontractors to do the work and the architect is in reality the general contractor, as far as responsibility and general direction are concerned. It was pointed out, among other things, that the competitive system of bidding had encouraged the public to believe that the lowest bidder could be expected to do as good work under the direction of the architect as the highest bidder, no matter what the relative skill of the lowest price bidder might be. It was urged that architects should constantly point out to their clients the difference in quality of performance between good contractors and bad ones, and not hesitate to acknowledge that no amount of specifications and no degree of careful inspection would secure a good job from an indifferent builder.

This whole subject of contractors' functions not only brought out many criticisms as to the lack of exact methods on the part of many architects but called attention to innumerable objectionable features on the part of the building fraternity, and it was decided that a meeting or conference should be arranged between architects and builders for a free and open discussion of all their relationships. This led to the question of architectural education, but it was decided to devote a special evening to that subject alone.

Advertising

When it came to the final topic, "Advertising," the evening was already well along, and the discussion was consequently very brief. Nothing particularly new was developed. It was very generally agreed that the ethical or unethical had little to do with it; that advertising of the ordinary newspaper variety would, of course, be foolish and that the right kind of publicity could be secured through the professional or other journals which published reproductions of executed work.

On the whole, the meeting was the most interesting held by this chapter in many years. It illustrated fully the effect produced by the discussion of such subjects in an organized manner within a group. While there were individuals who wrote letters about the programme of the Post-War Committee questioning the necessity of any such inquiry, every one in attendance at the meeting took quite a different attitude the minute the first speaker had acknowledged his own weakness and confessed to certain errors of judgment in the past. Immediately every man opened his heart and the old bluff about the fault being entirely with the public and not at all with the architects was laid aside. This rather suggests that the work of the Post-War Committee, as far as possible, should be conducted through meetings, because only at meetings does the real truth come out.

ROBERT D. KOHN.

The Building Contract of the Future*

By SULLIVAN W. JONES

COMPLEX as are the conditions surrounding the modern building industry, there are in reality only two fundamental questions involved, and even these two are closely related. The others are the natural developments of them. One is the contract system; the system of selecting either general contractors or subcontractors, through competitive bidding on the price for a complete piece of work, under which the owner buys his building from the contractor or a group of contractors for a sum stipulated in advance of construction. The other question relates to the architect and his function. Both of these questions are under consideration by the American Institute of Architects. The one on contract system is before the Committee on Contracts and Specifications, and the one of the architect and his function is being studied by the Post-War Committee on Architectural Practice. But these two questions are fundamental in character.

The Fallacy of the Lump-Sum Contract System

The contract system which was in almost universal use before the war had revolved about two wholly false assumptions: One, that a modern building can be described by drawings and specifications with sufficient completeness to provide for an accurate computation of costs, and, hence, for bids on its construction that are fairly competitive; and the other, that the contractors' business is that of selling finished work, and that he is essentially a merchant, who should, but by no means always does, possess a specialized knowledge of the suitable and economical use of the things he buys and sells.

The first of these false assumptions leads us direct to a consideration of the sufficiency of the architect's service, while the latter involves a study of the contractor's status under this form of contract. We have thus established at least one direct relationship between the two fundamental questions. While they have been stated separately, so interwoven are they that discussion of them singly is impossible.

Origin of the Lump-Sum Contract

The stipulated sum construction contract is a product of the mercenary spirit of modern industrialism. Until the early part of the nineteenth century, the beginning of the industrial era, the lump-sum contract for construction was unknown. The great buildings of the Middle Ages and of the Renaissance period were not designed by architects, as we know them, or built under contracts. They were constructed by societies or guilds on what we would now call the cost basis, and were paid for, as the work proceeded, out of the public funds or voluntary contributions. The designers were master builders, members of the guild which had trained them, but with unusual ability in design. The earliest construction contracts were signed with a master builder, who, like his illustrious predecessors, was both architect and constructor. He submitted his design and the price for which he would execute it. If there was competition, it was between designs with their corresponding prices. The builder had complete control of the work and the manner of its execution. The procedure was a perfectly safe one for the owner, because buildings were structurally simple, of few types, and the choice of materials was extremely limited. There was no question of standards of work; they were established by the pride which the artisans and the builder took in their skill, for neither pride nor skill had yet been destroyed by the feudalism of money.

Difficulties Develop

But with industrialism came accumulations of wealth by many who had not previously possessed it, and this change had an almost immediate effect upon practice in construction. In response to the demand for distinctive architectural effect in the homes of the newly rich, the builder with special aptitude in design became an architect. These owners applied to the purchase of their homes the same methods that had made profits for them in business. They strove to drive shrewd bargains with the contractor, and the architect was shortly called upon, not only to design the building, but to exact the utmost possible of the contractor for his client. The demand for distinctiveness in design and for luxuries led to complexities in construction, the employment of new devices and methods, all of which increased the architects' difficulties, both in preparing adequate drawings and specifications and in securing from the contractor what he considered the contract called for. In England, this condition produced the surveyor and the quantity system, while in France, the unit-price contract became the rule for better-class work, the unit prices being established by the national architectural society and recognized in law as standard, with the architect as "verificateur," a function corresponding to that of the English surveyor. The French system would seem to us most complicated, but it is the result of an effort at correction. But in this country we had done practically nothing until the Government was obliged to adopt a different system on its war contracts. Moreover, our problem is vastly more complicated than it ever was in either England or France, because we have led the world in the application of science and invention to the engineering of construction, and because American ingenuity has been freely utilized in meeting the demand for luxuries which have become successively conveniences and then necessities. Our buildings are now complex machines, the design of which requires the services of many engineering specialists, but we are still clinging to the contract practice of a century ago.

Competition in the Assumption of Risk

Let us assume for the moment that we wish to hold to the lump-sum form of contract and competitive bidding. Obviously, then, we must find some way of giving to the contractor in advance the information essential as a basis

*Excerpts from an address delivered before the Institute of Electrical Contractors.

for fair competition on price? Can it be done? Drawings and specifications may be improved through further standardization; inaccuracies of quantities may be largely removed by the adoption of the quantity system; and the cost of work may be placed upon a more accurate basis by the "open-price," which will also raise the price standard and assure a better margin of profit to the contractor. But are these partial remedies all that is necessary? There are always several ways of doing a thing, one less costly than another, and there will always be differences of opinion between the contractor and architect as to which is the best, or whether the substitute proposed is permissible under the contract. There will always be disputes over questions of quality because quality, both in workmanship and materials, is well-nigh impossible to describe. There is another important speculative element in every lump-sum contract, and it will exist even if drawings and specifications could be perfected. It is this element of risk which has now acquired such proportions that no sensible man is willing to assume it. When a contractor signs such a contract, he sells short for delivery over a stipulated period of time, the quantities of labor and material required. In some localities, in times more normal than these, or than those to which we look forward, the risk of loss to the contractor from a rising labor market has been minimized by wage agreements with organized labor. In other places that stability has not been secured. And the material market never has been and never can be brought under control. Estimating, even under the most favorable conditions, will always involve risk to the contractor, and as long as there are risks, competition will be based on risks instead of work to be done. The low bid, whether it be too low or not, will always be the product of the greatest error or the assumption of the greatest risk.

Competition Should Be Preserved

We are forced to the conclusion, it seems to me, that competition on price is economically unsound; which conclusion leads us to ask the question: Which is wrong, competition or the stipulated price?

Let us examine the case for the lump-sum contract. I have said it had a corrupting influence on everybody involved in it. Almost every ill and every evil in the building industry, I am satisfied, may be traced to the lump-sum contract. Under it the interests of the owner and contractor are diametrically opposed. The contractor's profit lies between the actual cost of the work and the amount of the contract. The greater the cost, the less the profit, and vice versa. The contractor's aim is, therefore, to deliver as little as possible, while the interest of the owner is in exacting the utmost of the contractor. The contract stands between them, setting up antagonisms where there should be coöperation, creating conflict of purpose where unity of interest is essential to success. Under the lump-sum contract the contractor has been a merchant, buying and selling finished buildings. All of us have been misled by thinking of the product rather than the method of production, by fighting over the division of profit rather than considering means of assuring reasonable profits to all who participate in the enterprise, including the owners. That is why the contractor has become a broker trading in contracts which represent finished buildings and their component parts, instead of a constructor or engineer performing a professional function.

Contractors Cannot Be Merchants

The arguments against the general contractor being a merchant are possibly more conclusive than any that can be directed against the merchandising function for the subcontractor, especially the subcontractor who manufactures and installs a product, but they apply, nevertheless, with the force of conviction to both. The general contractor manufactures none of the materials which he handles. He has no plant or factory and has no legitimate use for either. He has no capital invested in anything of permanent value to him. The money which he uses in conducting his business is a temporary substitute for the owner's capital ultimately represented by the finished building. What is it the contractor has to sell? Service, his expert knowledge of the fabrication of buildings. In the last analysis, service is the thing he has always sold, but instead of selling it to his employer, he has sold it to himself. The system has placed a premium on disloyalty and shrewdness in the contractor, rather than on engineering skill and efficiency.

The same contradictions have confused and misled the subcontractor. He has wasted his best energy fighting for trade discounts on the materials he purchases in order to resell them competitively at a possible profit. He, too, has struggled to make a livelihood through the purchase and sale of labor and materials when he should have centered his effort on perfecting his service and finding a market for it. If service is the commodity in which the contractor deals, and we wish to preserve competition, obviously, then, competition must be in service and not in the price for finished work. The value of service is measured in terms of results. If economy is one of the results looked for, and secured, let it be an asset to the contractor instead of stolen fruit to be concealed.

The Architect and the Lump-Sum Contract

But we have not yet put in all the evidence against the lump-sum contract. The architect has not escaped its insidiously evil influence. The average owner, the owner who is inexperienced in matters of construction, undertakes his venture on the assumption that the architect is omniscient, and that when a bid is received on the drawings and specifications it is all-inclusive. This is the fallacy of the complete and sufficient drawings and specifications. A mistake is made when an architect accepts employment without disclosing to his client the unavoidable limitations which are placed upon his service. As the work proceeds, omissions are discovered, differences arise as to what is meant by vague expressions and indications, and the architect is at once placed on the defensive with respect to the sufficiency of his drawings and specifications. He has the choice of confessing his plight to the client or covering it up by compromise with the contractor. Some pursue the former and honorable course; others, the latter. The position of the architect under such a contract is unwholesome. It is unfair to him. It is unfair to the owner who has sought the architect's advice on the basis of confidence. It is unfair to the contractor. It is a high tribute to the profession, and the professional tradition, that so few archi-

tects have succumbed to the temptations which constantly urge them to abandon the difficult role of conscientious servant.

Conditions and the American Institute of Architects

That the architect is keenly alive to his untenable position, and to the gravity of the consequences to the whole building industry if conditions remain unchanged, is evidenced through the appointment by the American Institute of Architects of a Post-War Committee on Architectural Practice, charged with the study of the architect, his function, relation to the public and public interest, and his education; and by the principles adopted as fundamental by the Committee on Contracts and Specifications in connection with its deliberations on the cost-plus-fee form of contract. These two committees, beginning work on two distinct questions, have found, for reasons I have already shown, that their labors are complementary; and I venture to predict that in the end their work will be coördinated, at least to this extent: That the Committee on Contracts and Specifications will perfect the cost-plus-fee form of contract and the other committee will recommend its universal adoption.

The Cost-Plus-Fee Contract

The cost-plus-fee contract, as we have known it, has been a compromise document. The status of the contractor, by reason of his contract liabilities, and by reason of the unchanged attitude of the architect and owner, was not radically different under this form of contract from what it had been under the lump-sum contract. While his interests coincide with those of the owner, the contractor failed to realize the nature of the relationship, and, consequently, his attitude of mind remained unaltered. The Committee on Contracts and Specifications feels that the change must be complete, and that such changes must be made in the document as will give the contractor a new picture of his status and responsibilities. The Committee asserts that, "in the light of recent experiences of the Government in the use of the cost-plus-fee system, the following general principles are felt to be fundamental":

"(1) The contractor becomes in effect a professional adviser of the Owner, as his 'Construction manager' and should be relieved of all contract liabilities inconsistent with such a relationship; (2) For this purpose the Owner should pay directly for all materials and should enter directly into contract with subcontractors rather than having subcontractors make their contracts with the Contractor. Payrolls must perforce be paid by the Contractor and reimbursement made by the Owner; (3) In view of this professional relationship, no 'bond' guaranteeing performance is needed or proper, any more than for the architect."

It is difficult to comprehend at once the full significance of this statement. The principles enunciated find expression throughout the document. There was a discussion at the last meeting on the expediency of changing the term "contractor" to "constructor," or "manager of construction," or "constructing engineer," but it was decided that a wiser course to pursue was to use the old and familiar term and let the contractors' wishes gradually crystallize into the choice of some substitute term which would be more appropriate and more descriptive of the new function.

This is the wording of the clause, which, in the older form of contract, was captioned "subcontracts." It now bears the title "separate contracts":

"All portions of the work that the contractors' organization has not been accustomed to perform, or that the owner may direct, shall be executed under separate contract. In such cases, either the contractor shall ask for bids from the contractors approved by the architect and shall deliver such bids to him, or the architect shall procure such bids himself, and in either case the architect shall determine with the advice of the contractor and subject to the approval of the owner, the award and amount of the accepted bid. The owner shall contract direct with such approved bidders, etc., etc."

This clause, it will be observed, establishes the relationship between the so-called subcontractor and the owner or architect, which the subcontractor has sought to realize through the elimination of the general contractor.

The Architect-Contractor Relations

The Post-War Committee on Architectural Practice has made several important announcements in connection with its study of the architect, his function and conditions of service, and it is interesting to note how the line of inquiry has led the Committee directly to considerations of contractual relationships. Under a subdivision of its work termed "contracting," the Committee has issued a statement now familiar to all readers of the Journal.

The Advantages of the Cost-Plus-Fee Contract

It must be now plain that the architect's status and function cannot be considered without considering, also, the status and function of the contractor. It seems almost superfluous to point out the advantages to the whole building industry from making the cost-plus-fee contract the rule instead of the exception. It is important, however, for us to think of this proposed change in terms of results, so that we may all have a clear conception of what it is we are striving for. But when we think in terms of results, we again find it impossible to think of the architect and the contractor separately. First, the contractor, or let us call him the constructor, will be selected on the basis of confidence and his service record. Since the contractor's profit will no longer depend upon his ability to cheapen the work, which has been the motive underlying the general practice of offering substitutions, we may expect fewer discussions of this kind in the future. Considerations of price alone will less and less influence the selection of materials. The architect and the contractor will work together instead of in opposition. The knowledge and experience in construction which the architect lacks will be furnished by the "constructor." This, to my mind, is one of the most important results that will be secured, for it must be realized, and is realized by the thinking element in the architectural profession, that ability in design, which reaches its highest development only in men who are sensitive, imaginative, and impulsive, is wholly incompatible with the scientific quality of mind that works in exact terms of fact and statistics; an essential prerequisite to the proper performance of the "constructors" function. Under the cost-plus-

fee form of contract, the architect, the contractor, and the owner enter into a tri-party agreement to accomplish a single end. It does not require much imagination to see in this change in the contractor's status the reincarnation of the master builder of the Renaissance, through a virtual, if not an actual partnership of the two talents that produced the world's most inspiring and enduring architectural monuments.

The salvation of the architect, the contractor, and the industry lie in such a partnership of talents. If it cannot be brought about, I predict that contractors will try to become architects as well, and that architects will attempt to become builders—and, in the broad sense, few will succeed. Buildings will be either poorly constructed or poorly designed, and the loss to the public and in the prestige of the industry will be immeasurable.

In connection with the adoption of the cost-plus-fee contract system, I wish also to point out the importance of a standard cost accounting system and the greater value of the open-price plan as a powerful factor in education and in establishing mutual confidence.

Change Needed in Policy on Building Loans

There is one, and only one, serious difficulty which lies in the way of securing these fundamental reforms. It will be necessary to effect a change in the policy of the lender of money for construction. Relatively little new construction is carried forward without building loans. Such loans are usually a certain percentage of the contract cost of the building. The question is, can the great lending companies be made to feel that they will be amply protected in lending the same percentage on a carefully prepared estimate by a reputable "constructor," even though the amount of that estimate is not guaranteed by a contract and bond? I believe that, ultimately, such loans will be secured on the basis of confidence, even more readily and with less question as to values and risks than has been the case in the past. And I believe, also, that loans so made will be more secure than those made on the lump-sum contract ever have been. This must be so, because the building will be a better investment; both upkeep and depreciation will be less, and costs will rest on the stable foundation of true values, not on the insecure basis of speculation.

The New York Reconstruction Commission Studies the Housing Problem

One of the principal committees of the Reconstruction Commission which was appointed on January 20 by Governor Smith of New York, is to recommend a policy in regard to housing.

During the past few years, through the influx of war workers, there has been a large increase in the population of various parts of the state. Meanwhile, there has been practically no building of houses. In New York City alone the usual annual increase is over 100,000 persons. Apartments for only about one-half this number were erected in 1917, and probably not more than one-fourth of the normal need was filled in 1918. The building of houses for the poorer class of workers in New York is practically at a standstill now. Insurance companies and banks have invested in Liberty Bonds much of the money which they lend under ordinary conditions for building houses in New York. At the same time uncertainty as to the future cost of materials is holding back all speculative building. Even if there were sufficient money available, it is questionable whether housing could be carried on successfully under our present methods, without a radical reduction in the cost of building or the increasing of rents far beyond the means of the unskilled workers. That this is true not only of New York City, but also of other portions of the state was made evident at the first public hearing of the Housing Committee, held at Buffalo, on February 7. At this meeting the secretary of the Chamber of Commerce of Niagara Falls said that, as soon as business is again under way, the same large turn-over of labor which had been experienced during the war would result from the insufficiency of satisfactory workingmen's houses. At the second hearing of the committee, held in New York City, it was pointed out by more than one speaker that lack of proper housing for the poorer paid workers was not a result of abnormal conditions, but had existed long before the war.

So it is apparent that, if the work of the Housing Committee is to be of permanent value it must do more than answer the question: Is there any way of starting building at once, so as to meet the pressing need of more housing? It must enter the much broader field of developing a practical and workable policy in regard to housing. Its investigations must be such as to find an answer to such questions as these: What are the actual conditions under which the workers of New York live? Are they what they should be? If not, can private initiative, unaided, supply sufficient houses such as to give an opportunity for the standards of living which should be provided for American life? What measure of constructive or restrictive legislation is most likely to secure the desired end and yet leave the greatest possible freedom of individual initiative? What can we learn from the experiences of foreign countries? Can these experiences of other lands be modified to meet the distinctive features of American life? Can any part of our-own experiences in war-time be developed to meet our peace-time needs?

To aid his committee in making the studies that will be necessary to find an answer to these questions, Mr. John Alan Hamilton, of Buffalo, the chairman of the Housing Committee, has appointed an advisory council, consisting of men and women experienced in the financing, planning, building, and managing of housing and the development of real estate, as well as experts in housing legislation and its administration. Among the architects who have been asked to assist as advisors are B. L. Fenner, R. D. Kohn, F. L. Ackerman, Andrew Thomas, Miss Marcia Mead, and Clarence S. Stein, secretary of the committee.

Living Architecture*

Concrete seems to be a poor building material, but it brings back one of the fundamental methods of construction—that of continuous aggregation, a method which, while the material was mud, first produced vaulted and domical buildings, a great class of structures which are the natural outcome of such plastic materials. It thus gives to us once more the possibility of erecting solid roofs. Such a system of homogeneous building, with roof of cylindrical, conical, domical or other forms—the low dome, cone and pyramid seem especially suitable forms—taking the place of the poor wood and slate coverings we have been accustomed to, opens up large possibilities of more dignified and interesting types of planning as well as more monumental superstructures.

A weakness of modern architecture is in its not having sufficient grasp of modern scientific construction. The failure of English engineering is that it is usually mean and brutal, like Charing Cross Bridge, or, ashamed of itself, it seeks for disguises like those of the intolerable Tower Bridge. Judging by its works rather than its claims to "science," our engineering seems often both ignorant and impotent.

We have both to get rid of fear and develop a proper pride for our own matters. There is nothing necessarily evil in modern materials or requirements; it is the spirit that tells. I have no love for modernism as such, and fain would hide my head in the sands of the past, but I cannot help seeing that the courageous mind will shape even seemingly hopeless materials to its purpose. As I found well said in an examination paper, "these things are plastic to the spirit." Plastic to the spirit are even concrete and iron, if they must be used, no less than marble and bronze. The ideal for masonry has been definition and delicacy, sharply cut angles, moulding, carving. The ideal for concrete construction is much the reverse: it is that of continuous aggregation into a homogeneous, chambered mass; the structure is "cast;" simple forms and rounded edges are required. Its special disadvantage is in being liable to cracking, and the least cracking in such structures seems to destroy the possibility of our having any pleasure in them. A building of such a fabric should be as continuous and sound as a china vase. It is necessary first of all to improve the material so that it won't crack. Our continued use of materials like mosaic and cement floors in such a way that rivers of cracks wander over them after a few years is somewhat astonishing.

Once having mastered the material and having produced a fairly even surface, we have to bring out what it can best do on its own merits, and put away any attempt at imitating forms developed in stone and brick building. Curved lines in plan and slanting and curved surfaces would seem to be specially appropriate to this mud-like material which must be modelled as it were into form. Inferior angles of Roman rooms were usually rounded. Corners might be rounded both within and outside; cornices, if any, might be simple coves or rounds. The surface could be finished with white and color washes, plastering, painting, roughcast, sgraffito, marble-veneer, mosaic, glazed tiling and glazed terra-cotta applied in panels and medallions. The aim should be to develop structures in which the walls and roofs are all of a piece; and there is surely something exciting in such a mode of building. The general design must in every case be arrived at as the best constructive solution of the given problem, but it must be a fine and civilized solution, not a raw and haphazard one like so many of our engineering works. Exquisite common sense is wanted. The aim should be for masterly construction appropriately or even delightfully finished. Beauty in structures is not a question of mere shapes, but it is the evidence of mind acting on materials. If we could have a fine market or railway shed (or even a cathedral) schemed like some of the wonderful war sheds drawn by Mr. Muirhead Bone, well built of its kind, flooded with light, carefully finished, brilliantly whitewashed like a lighthouse, and decorated with fine paintings, we might "catch our breath" once more at the sudden sight of a piece of living architecture. It would be as interesting as a concrete ship. Whenever our buildings are again designed for their purpose as directly as a fiddle, a gun or even a motor or airplane, they will be romantic once more. Again, let me say, my heart is with the old and the humble. I do not desire these scientific developments for their own sake, and it is a cursed spite that I must try to set them right. One of the buildings which has most interested me recently is the newest museum building at South Kensington, temporarily completed with the "style" left out. Many of the temporary war buildings are also direct and structurally interesting. Although such buildings are frequently only skeletons, they demonstrate that a piece of architecture may be got to stand up without shamming dead. Now, having proceeded so far, what prevents us going forward to finish and refine and even adorn the thing without burying it in undertakers' doleful trappings? Why is it that one may never see a building for its ornaments? Let us consider the "carcass" of an important public structure. A rim or lining of marble might be put around the doorway, and over it could be some fine heraldry carved, gilt, and coloured from the design of one of our heraldic experts; not the fat tame stuff we are accustomed to, but keen and vigorous. This would probably be enough, we don't want our buildings worried all over, we want richness and colour and food for thought, but we also need bareness and relief and peace. Or a set of fine sculptured panels, about something, might be set low down where they could really be seen and loved —really loved—not tolerated or hated. Or an inscription really saying something in clear, strong lettering might be cut in in a band high up, or in a large panel, or, again, this might be in mosaic of gold letters on blue, or black letters on gold—not timid and frightened and non-committal, but an inscription to lift up our hearts. Or between the windows might be a set of really handsome medallions in glazed earthenware, either in relief or only painted devices,

*Extract from No. IV of the series of articles by Professor Lethaby which have lately appeared in the *Builder* under the title "A National Architecture."

or portraits, but again, with some meaning and intention—surely we are rich enough to have meanings and intentions. Considering the problems of finishing in some such ways as these, and forgetting the Gothic, Elizabethan, and Italian styles, there is no end to what might be done in a perfectly frank, reasonable and healthy way. If such a method were customary, architecture would at once stand out again as a sincere and manly art and gradually drop more and more of the powder and padding. I do not ask for bare and bald buildings—an architecture of the simple life and all that; not at all. I want to open a way to intelligence, expression, life and even exuberance. Quality of art is quality of life, and an architecture of reality is a necessary part of "the National Being."

Notes by the Wayside

MANY YEARS AGO the name of Peter Cooper became familiar to us. In the readers of our primary school days, along with the story of Dick Whittington, Lord Mayor of London, was the story of wise and honest Peter Cooper, of New York, and his founding of that great educational institution, Cooper Union, where the youth of his city might gain knowledge under the proper environment, without enduring the hardships he himself had endured. It was also Mr. Cooper's idea ultimately to utilize one floor of Cooper Union as a museum of mechanical devices. Perhaps the idea of a museum of decorative design was far from his mind. But here enters fate in the persons of two little girls in plaid dresses made on one of the first sewing machines, with their hair tightly braided in unæsthetic "pigtails," of whom we shall speak later.

Outside of New York, the name of Abram S. Hewitt is less known than that of Peter Cooper, but to Hewitt, who married Mr. Cooper's daughter, fell the task of carrying on the gigantic work which Cooper began. Mr. Hewitt's French ancestry gave him an innate love of art and the beautiful. This love and understanding, fostered by travel in Europe when great awakenings in the world of art like the Crystal Palace Exhibition of 1851 and the Paris Exhibition of 1855 were taking place, roused in him an unquenchable desire to make it easier for his children and his fellow citizens to see and enjoy what he had seen. At the cost of many a sacrifice of time and slender means, he took his children, the two little girls before spoken of, to all available exhibitions and sales of works of art; he placed in their care his growing library of wholesome and standard books, and he made live for them through books and illustrations, the great exhibitions he had seen.

It is not so much to be wondered at, then, that as they grew older, these children, with their love of the beautiful so cultivated, should purchase with their savings of pocket money, a small collection of fine textiles rather than spend their money on such amusements and pleasures as would seem more natural for children of their age. The rest of the story is romantic and is, as Miss Eleanor Hewitt, one of the two girls, says, a curious mixture of miracles and fate. These girls were going to make a museum and were undaunted by the size of their task because they did not know how big it was. It all reminds one of the paraphrase:

"Angels step in
Where fools fear to tread."

Contributions, gifts, and opportunities came thickly to this pair of ardent workers, and now the museum is a tremendous fact. The history of this unusual institution is filled with remarkable incidents: How Mr. Morgan, on the eve of his departure for Europe, became interested in a collection of textiles for which the Misses Hewitt were negotiating; how be bought this collection with two others and presented them to the museum, in order, as he told Mr. Hewitt, to give his daughters pleasure; how at a private dinner party a chance meeting with M. Léon Decloux led to the acquisition of his comprehensive collection of original drawings which he had no previous notion of selling; how a collection of porcelains arrived at the custom house unpaid for, and how, with the same mail which brought the notice of arrival, came a cheque for the precise amount of the payment due; how a previously unknown visitor, after spending a delightful morning with the directors, left a cheque for $10,000 as a memorial to her mother.

From the delightful Decloux collection of drawings to the smallest and least pretentious object, it is all useful to the worker. Besides the collections themselves, there are more than 1,000 scrap-books. For the making of these, rare and valuable books have been taken to pieces, much to the consternation of some who believed less in the utmost use of things. But the scrap-books and the collections are all arranged for the greatest ease of use and study. Its logical, consistent arrangement is the only thing which saves the museum from being hopelessly overcrowded in its inadequate housing. The Misses Hewitt, when looking for a home for their ambitious undertaking, bethought themselves of the idea of their grandfather in making one floor of Cooper Union a museum, and on one floor of Cooper Union it is today. It is all one great, unrestricted, and intimate workshop, and every corner of it shows the inspiration of the love of the labor put into it by its founders and again its dedication to the worker. Any one who sincerely wants to work with the background of the best work of the past for an inspiration, may come to this Cooper Union Museum to work. He is assured a welcome and all possible sympathy and aid. It is not a museum for fashionable visitors, but rather for appreciative workers. It does not contain numerous priceless treasures, but it does contain almost numberless objects of inspiration, all arranged in a most logical and instructive way. We shall not be far amiss if we call it, with its encyclopædic scrap-books and alcoves of objects, a great encyclopædia of decorative design—always ready to serve him who seeks its pages.

On leaving the museum the other day, we turned to that beautiful memorial to Peter Cooper in front of Cooper Union and regarded it with silent reverence. All honor to him and those who have followed in his footsteps. Here was a real citizen—the world needs more like him.

The Theory of Contrast in Pictorial Presentation

By ALFRED HOUGHTON CLARK

BRIEFLY stated, the theory of contrast is that everything which is seen as an entity is seen by virtue of its contrast with its environment and that in pictorial presentation such an entity can be presented only by the proper indication of this contrast. This theory is so simple that it is difficult to realize how broad and all-embracing it is.

With this theory as a fundamental always in mind, the author has taught many a pupil to see things in the proper way and to depict them, if not always in a masterly way, at least in a clear-cut, direct and proper way. One cannot be taught to become a master.

It has been found that a thorough appreciation of the theory of contrast leads to a better appreciation as well as a better practice of pictorial presentation, while its simplicity brings it within reach of any intelligent layman.

Any one of the physical sensations is merely a form of comparison between no sensation and some sensation, more or less. Hearing is recognition of the difference between silence and sound. Touch is but the cognizance of the difference between a contact more or less abrupt and more or less extended, and no contact.

Vision is only another form of comparison and is subject to the same law: that the point of attention is at the point of change. In vision the change is marked by a line of contrast; and drawing and painting, from the earliest scratches to the most highly developed pictures, are mainly concerned with the location, direction, extension and quality of these lines of contrast.

A pictorial line, whether a mere outline or the contour of a mass, is a statement of a visual fact. It says, "This form occurs here. It extends so far in this direction, so far in that. It comes out lighter or darker, brighter or duller, than what is behind it." If this were always borne in mind fewer mistakes would be made in the use of elements of design.

All things are seen as separate and more or less distinct. When the entire contour of an object merges or fades into the adjacent area in the field of vision it loses its distinction and becomes a part of the larger shape. When a part of the object merges into the background that part ceases to be an element in design and the other parts carry the element of distinction. An object may be so situated that the only distinct line is found on one side and from that point the tones are graded imperceptibly into the mass of the background.

Human beings experience visual impressions only by contrasting objects or forms with their surroundings or backgrounds. It is clear, then, that the degree of contrast is the measure of the vividness and clearness of the visual impression received; for the greater this degree of contrast, the more vivid the edges dividing the contrasting areas, and, consequently the more vivid the whole image, bound and determined by these edges, becomes. From various psychological manifestations in childhood it is probable that this appreciation of contrast and visual impression due to contrast begins very early.

It is wonderful how surely, how exactly, these expressive differentiations become unconsciously fixed in the mind. Any clear analysis of them is unusual and difficult, however. We are dealing with what we call an instinct, the faculty of recognition of substantial qualities at the sight of various contrasting tones applied upon a surface. These edges and modulations stand for certain facts known to all though understood by few. All normal persons have the instinct which recognizes a deviation from the vertical or the horizontal. All recognize variation of light and shade. All recognize variations in size and distance. All recognize difference in color, both as to hue and intensity. All have a sense of relative position. All have a sense of relative force or degree between successive areas placed in contrast. Therefore the pictorialist appeals to universal instincts and may play at will upon the emotions of an impressionable if not an analytical audience if he understands his instrument and his audience.

We know objects as separate and distinct but we *see* them, sometimes as entirely separate, sometimes as only partially so. Therefore, in a picture, it may be chosen to render the actual transitions as they appear to the eye, or, to figure the various objects as entirely separate and distinct from their background. This latter method is largely employed in drawings or paintings for scientific and commercial illustration.

The painter has to consider, in making his appeal to the mind through the eye, whether he shall appeal literally to the memory of the appearance of things or, figuratively to impress the receptive mind.

If he is to represent actual transitions he must not only study carefully the various phenomena as they occur in nature but must train himself so to use his materials as to render these phenomena faithfully, up to the limit of power of those materials. If he is to make a figurative appeal he must study the relation of cause to effect, the probable force of the various factors at his command upon the beholder. However spontaneous his effort may seem there must be a "method in his madness" if there is to be any permanent value to his work. No pictorialist who persists in dragging weakening or discordant elements into his work can succeed in making a favorable impression.

Undue or ill-considered emphasis upon a subsidiary line lessens the force of the really important elements and he must discover by unremitting experiment just how best to balance the elements and to place the emphasis properly.

Contrasts and Gradations

A picture is a structure of tone-transitions and these may be classified as: Contrasts, which arrest the eye, or, gradations over which the eye passes without interruption. The abruptness of a contrast and the fluency of a gradation have each their especial and peculiar effect upon the mind, and the artist who has full command of these resources may express his ideas with power.

It is well to illustrate the difference between a contrast and a gradation by the difference in the transitions of tone

on the surface of a hexagonal prism and those on the surface of a cylinder. In one you see sharp parallel lines of contrast marking the faces. In the other you see a smooth gradation from light to dark and again from dark to light if there is reflection. The contrast is a distinct *jump* from one tone to another; the gradation is a *slide* from one tone to another—an infinite series of infinitesimal, and, therefore, imperceptible contrasts.

While the terms contrast and gradation refer respectively to abrupt and to gradual changes of tone, the term transition covers all varieties of change in the visual aspect of surfaces.

There is the major transition from one object to another, and there are minor transitions within the area of the object.

What is called the "modelling" of surfaces depends upon the character of these transitions. These may be more or less abrupt, may be classed as contrasts or gradations (or modulations if preferred). In any case, they should be characteristic of the structure or the texture which they are intended to represent.

Any two adjoining areas of similar value tend to merge or melt into a larger area whose edges make perceptible contrast: so, if separation is desired, one of the areas must be darkened or lightened at the edge or as a whole, or a separate outline of more or less contrast inserted.

Lines of contrast are important not only from the fact that they mark the determination of separate forms and are psychologically the strategic points in sensation, but also because a work of art must be constructed part by part; and no distinguishable area of contrast can be applied to a surface without consideration of the line which its edges make upon that surface. Wherever there is a perceptible shape, there is a perceptible line, and that line must begin somewhere and proceed somewhere and somehow.

The control of that line, of its location, direction, extension, and quality, and the degree of contrast of the edge of the area which it determines, may be either premeditated or instinctive: but control there must be if it is to become anything but a meaningless meander or an inconsequential smear.

By quality of a line we mean whether the line is straight or curved, simple or complex, in its movement.

In the simplest form of picture, a shape is imposed on a plain field or is expressed by an outline. In more elaborate representation, one area is succeeded by another directly contiguous to it and any extension of the form takes so much from the adjacent one.

An outline only describes the form. It is not the square but the fence around the square. It is not an apple but a line around an apple. Some of our educators have felt so strongly the necessity of fastening the attention upon the properties of the form itself that they discard the use of a preliminary outline and follow the method of the professional decorator who lays the forms on the background directly, with strokes of a well filled brush, securing, as far as possible the entire shape with a single stroke. But the brush, though expressing perhaps an entire area, makes a line at the edge which is subject to the laws governing lines of contrast and must be controlled.

There is always the danger that an outline may be taken as an end in itself rather than as a means to describe a form. The copy-books of an earlier day had this defect. Those outlines, cold and dead, became mere conventions and when the student finally applied himself to the study of drawing from actual objects he found himself poorly prepared for the task. It will be noticed that the child attains precision of shape more easily in paper-cutting than with the pencil, for, in cutting out forms with the scissors, he is always conscious of the material inside the line. When he draws with the pencil he is as truly cutting out as if the scissors were used, but it is not directly realized.

The author has seen teachers in the lower grades of our public schools take a batch of colored drawings of flowers, birds, or other objects, made by the children, and, finding them ragged, fuzzy, and confused in contour, return them to the children to be cut out with scissors. Then, when pasted carefully on cards or sheets of paper, they appeared to much better advantage.

The earliest drawings which remain from prehistoric times are in the form of outlines, scratched upon surfaces of bone. The first juvenile drawing is a scratch, or a linear smear of contrasting material, upon any convenient, plain surface; meandering streaks of little or no objective suggestion, gradually assuming forms in which the drawn line is brought back upon itself, enclosing and, therefore, isolating a distinct shape. The next step in expression is to fill in the enclosed area with color.

The drawing-act, delineation, like all primitive acts, follows the path of least resistance, and definite control comes gradually by practice. When a child is old enough to realize the graphic function of drawing, it is time to call his attention to the necessity of truth to nature and construction. He will exercise control over the direction and extension of lines when he becomes interested in accuracy.

Edges

We know things visually by their shapes. Shape is determined by the movement of edges. A perfectly simple form has but one edge, that on the outside, which defines it as separate from all else. A complex form has within this larger contour a series of smaller shapes marked by lines of definition wherever the transitions of tone are distinct. The starting-point of the line determines the location of the enclosed form. The direction or directions and the extent of those directions determines the shape and the size. The quality of the edge determines the texture. The emphasis given to the edge by the degree of contrast which it bears, determines its force.

Every individual form or area is seen as in front of the one behind it; and at its edge the degree and character of each contrast should be observed and properly recorded in the picture. Beginning at the foreground there should appear a series of justly rendered edges, from the nearer to the more and more remote. A true statement of these transitions, well arranged, will insure a fine pictorial result, and the firm extension of ground and the ethereal extension of the sky will each be duly expressed. There is, in figure-painting and portraiture, a similar series of transitions whose principle must be observed if the picture is to be intelligible to the common eye.

The edge of every separate area is not only the boundary

of its own shape but, quite naturally, inasmuch as it separates adjacent areas, it is at the same time a *boundary* of every *adjacent* area.

In drawing from objects it is often possible to secure a closer precision of shape by considering the form of the adjacent area. One writer on the study of academic drawing advises students to study all contours from both sides as a distinct aid to the realization of the exact shape of the object and an error in contour may often be discovered in this way which otherwise would escape the eye.

Certain materials lend themselves more readily to direct and beautiful expression than others, but whatever materials are used, the means to the end are always the same, an appeal to the eye of various visual transitions upon a surface. Any mistake in the sequence of gradations or in the disposition of the lines of contrast or edges weakens the appeal.

In the use of such materials as transparent water-color, in which the work should be left as laid, without disturbance, extra care is required in the determination of form because there is almost no chance for correction. When the blue tone of the open sky is laid against the white clouds it is determining their form for good or bad.

Other materials like oil, pastel, and opaque water-color, are possessed of considerable "body" or covering power; or, as in the case of charcoal, they are so mobile that erasure is easy. In their case an opportunity is allowed to trim back and correct the edge or line of contrast when the next tone is laid on.

The Spanish artists have an old saying to the effect that if you secure good edges you may smear dung in the middle. This means that the edges arrest and carry the eye, that they bear the greater share of the expressive function. They express by their contrast the degree of movement of the surface and by their quality the texture of the material. In decorative schemes the comparative contrast of the various edges of shapes determines their force in the total effect. In thorough tonal representation it is not enough that the various forms are detached more or less from their surroundings or are situated nearer to or farther from the eye; but the manner of the transitions, the character of the edges should make it plain over what sort of substance the light is moving. As the light moves so the brush must move, whether it express the light positively or negatively.

The great masters of painting are seen to render their textures with great care at the exterior edges and also along the interior lines of transition from light to dark, leaving the larger spaces comparatively broad in treatment. Hair, metal, satin, velvet, skin, all "break" characteristically from light to shade. Thus, in broad, masterly handling, we find texture exhibited only at the edges of the masses.

This suggestive rendering of textures is much better presentation than the laborious elaboration of the hairy hide of an animal, the blades of grass upon the ground, or every leaf upon the tree. There is, in landscape, a larger form of texture, as seen in the transitions from grass to earth, to stone, to bark, to foliage, to water, to distant mountain-masses, to sky, and from clouds to the clear blue.

An abrupt contrast is in itself emphatic according to its degree and its location in the picture. But there may be many contrasts scattered about the field and to be conspicuous it must be greater in degree or extent than its fellows or so located that it is conspicuous. As a matter of course, the more conspicuous contrast should emphasize the more important element.

Beside the use of contrast for separation or definition, it has another more subtle function, its use for emphasis. However we may define emphasis, as "stress in sequence," "bearing out," "increase of pressure," or "intensification," we are dealing with an element of great importance in pictorial presentation. In conveying a message to the mind through the eye, we present a group of major and minor elements. In just such degree as the major elements are made to stand out, is the message clear and the effect profound.

One of the most effective and yet most subtle means of emphasis used by the old masters was the enhancement of contrast at occasional strategic points. In the presence of an old masterpiece, if you will look carefully along the edges of any important area, you may discover that extra detachment has been given, not by any extensive variation of the tone of the surrounding area, but by skillfully introducing a narrow strip of lighter or darker value or of contrasting hue where the contour of the object and the background meet.

It may be the edge of a hand or the neck or a bit of the cheek or hair which the artist wishes to detach without altering its value, so he slips in a line of dark at that point on the edge of the background. If it is a dark contour to be brought out, a narrow light line is placed behind it. At a short distance this enhancing strip is not noticeable but its effect is apparent. It is not an outline, as generally understood, for an outline exerts its separating effect on both sides and continues throughout the extent of the contour. While it is true that in Nature we see no outlines, the aureola surrounding any dark edge when seen against the light and the well-known phenomena of complementary color-suggestions due to "persistence of vision" give ample sanction for the introduction of a narrow strip of enhanced contrast at desirable points.

The landscape painters of an earlier day used to speak of the values in a picture, meaning the respective force or tenderness of the tone-relations to express distance. All far-away objects were recognized as appearing dimly, in delicately related tones, while nearer objects appeared more and more distinctly contrasted according to their nearness; thus constituting a scale of expression of the third dimension in which no error could be made without having the effect of putting the offending object out of its proper place. Today we express this principle by the form "atmospheric values," and when we say "values" we mean the place which any tone occupies in a graded scale from white, the highest tone, to black, the lowest. In such a scale the utmost number of distinct steps which can be recognized by the eye in sequence is judged to be about seventeen, but the scale in general use is the one of nine steps arranged by Professor Ross, of Harvard University: White, high-light, light, low-light, middle value, high-dark, dark, low-dark, black. The steps are distinct and the intervals equal.

A picture may be made in any part of such a scale: in the upper or the lower register, in the middle, or from the extremes. The smallest number of tones which may be

employed is two, one contrasting more or less with the other. A very simple combination, often used in elementary instruction, is of three tones, white, middle, and black. Our public schools use, also, a scale of five tones, white, light, middle, dark, black, which gives considerable range of expression and is easily appreciated.

A photograph or a half-tone print of any sort of drawing in black and white may be considered as an example in balancing quantities of lighter and darker tones. In addition, the knowledge of a measured scale is of great service when we consider that in the use of color the various hues each have a definite place in such a scale and must be used with that in mind. Professor Ross distributes the colors as follows in the Neutral Scale of Values: White, high light (yellow); light (orange-yellow and yellow-green); low light (orange and green); middle (red-orange and green-blue); high dark (red and blue); dark (blue-violet and violet-red); low dark (violet); black. These colors are in the greatest intensity at present obtainable in pigments.

However, the value of a colored area, pictorially, does not depend so much on its place in a measured scale as upon the relation which it bears to the surrounding areas. Under the psychological law, the degree of contrast as seen at the edge is the important thing, rather than the area's place in a scale.

For the purpose of illustrating the relation between the Scale of Contrasts and the Scale of Values take the two extremes and the middle from the Value Scale and place them on three separate sheets of paper, white, middle gray, and black, respectively. When this scale of three tones is placed upon the white sheet the upper value, white, makes no contrast with the surrounding paper, so has to be outlined for separation, and its degree of contrast is zero. Middle gray is then four degrees of contrast. Black is four degrees deeper still, or eight degrees from white. Place these same three values upon the gray sheet and degrees of contrast will be marked as follows: Middle gray, zero; white, four degrees lighter; black, four degrees darker. Finally, place the three values upon the black sheet and the degrees will be marked: Black, zero; middle gray, four degrees lighter; white, four degrees lighter still, or eight degrees from black.

It will be noticed that, in the first scale, white must be outlined either with gray or black; that in the second, gray must be outlined with white or black; that in the third, black must be outlined with gray or white, to prevent its being lost in the surrounding space. This illustrates the principle governing the use of outline for separation or emphasis.

A picture should be examined critically to see if it stands the visual test: that no part comes out unduly, and that no part which should be definite is weak or confused. As the eye passes over a picture, it is arrested for a longer or shorter period at every contrast, according to its degree and quality. Any contrast of exceeding strength will persistently recall the eye, and, if untrue or inconsistent, will impair the value of the work as long as it is allowed to remain. A mistake in contrast is, undoubtedly, a mistake in values, but the sense of immediate contrast is the simpler and stronger sensation and, therefore, gives a better criterion. If the values are right, the transitions will be also. But the transition is the point of importance.

The real success of a work of art is measured by the extent to which the method shows the purpose or meaning of the artist. It seems a pity, therefore, that this principle has been so neglected in our schools. Some of our most prominent painters and educators now recognize the fact that the most important principles are acquired after leaving the schools; and they advise young persons of talent to keep away from the class-room and to secure their motives and methods by direct contact with actual work with professional workers.

In the last analysis, a completely rendered picture is of the nature of a mosaic or an inlay in which every separate form has its exact place and interlocks with every adjoining piece. This principle is of great value, for the utmost pictorial efficiency is secured when every separate element is rendered firmly and surely throughout its extent. Such work always has great advantage over the uncertain rendering of those who merely niggle over their surfaces.

It is a very simple matter to paint a picture, so simple that few can do it well. Given a canvas of the right shape, you sketch a few lines here and there which divide it into proportionate areas, then fill these areas in with appropriate color in tones justly graded, here for distinction, there for modulation; that is all. Yet we see canvases by the thousands containing gross violations of this simple formula: exhibiting contrasts where there should be gradations, and gradations where there should be contrasts, teasing the eye with ill-conceived emphases and ill-disposed lines, the purpose of the picture frustrated.

Summary

1. Contrast is abrupt change of visual impression in a single step; a jump from one tone to another.

2. Gradation is gradual change of visual impression in a series of infinitesimal and imperceptible steps; a slide from one tone to another.

3. Contrast appears in a line of more or less extent, either as the actual edge of an area or as an element of separation.

4. A line of contrast has four properties: location, direction, extension, quality.

5. Degree of contrast is the measure of differentiation and, therefore, the source of emphasis.

6. The eye follows lines of contrast; they are the edges and the whole drawing of pictorial presentation in the final result.

7. The edge of every separate area is not only the boundary of its own shape but, at the same time, a boundary of the shape of every adjacent area.

8. To measure contrast, the range from white to black has been divided arbitrarily into nine equal steps; these nine steps, arranged in sequence, comprise a Value Scale. From this Value Scale is formed the Contrast Scale, by designating numerically the degree of contrast which each of these tones bears to the adjacent one.

9. The essentials of a picture are few.

10. Contrast is the sole means of expression.

11. Composition is the science of the use of lines of contrast according to psychological law.

News Notes

Registration of Architects

Recently, in answering an inquiry regarding the New York law for the registration of architects, Mr. D. Everett Waid, President of the State Board for the Registration of Architects, commented on the salutary effect of the law. If architects are not registered, their prospective clients ask why, and as a result the certificate of registration is being recognized as a certificate of competency. It is also leading students and beginners to study in those colleges whose diplomas qualify for registration, and deterring those who have not the opportunity of so studying from entering practice until they have qualified through private study and experience in some good office. It must be remembered that the New York law does not prohibit anyone from practising architecture, but merely prohibits him from calling himself an architect.

Several states are now considering registration laws and doubtless many others will consider them in the near future. Mr. Waid suggests that, as it is highly desirable that a uniform minimum standard of educational requirements be adopted among the several states, a draft of any proposed law should be submitted to the Institute's Committee on Registration of Architects, of which Mr. R. E. Schmidt, 104 S. Michigan Ave., Chicago, is chairman, for criticism and suggestions. The Board of Directors of the Institute heartily favor and desire such action.

Subcommittee on War Memorials

At a meeting of the Executive Committee of the Post-War Committee held in New York City recently, the reference of war memorials to the Post-War Committee was considered.

It was decided, as a number of plans are now under way to give advice on this subject, to avoid overlapping, Mr. Horace Wells Sellers, Stephen Girard Building, Philadelphia, a member of the Post-War Committee, was appointed chairman of a subcommittee in charge of the subject of war memorials to which applications addressed to the Institute should be sent.

Mr. Sellers was empowered to name additional members of the committee without regard to Institute membership and to include both professional and lay members, if he so desired.

Architectural Unity in France

The project proposed by the Société Centrale des Architectes Francaises, and looking toward the amalgamation of the principal French architectural societies, has become an accomplished fact, the program for unification as put forward by the Société Centrale having been formally adopted by the Société des Architectes Diplômés, and the Association des Architectes Provinciales. Undoubtedly this marks an important step in the history of modern architectural practice in France. Divided councils and cancelled effort were too clearly condemned by war to let the lesson pass unnoticed. Architectural unity—a world-wide unity—is the program of today and toward the attainment of that unity the profession should work unceasingly.

National Apprentice Schools of Design

As a result of a series of meetings held in New York during the past few weeks, by various societies and associations interested in the development of the arts and crafts, there will soon be opened in New York the first unit of the National Apprentice Schools of Design, the aims of which were set forth in the last issue of the Journal.

The movement took definite form when in February, the following Executive Committee was formed to establish the New York unit:

Joint Committee—

H. Van Buren Magonigle, *Chairman*

W. Laurel Harris, *Secretary* John P. Adams, *Treasurer*

Representatives from the Architectural League—

Leon V. Solon Horace Moran

Representatives from the National Academy of Design—

Elliott P. Daingerfield Francis C. Jones

Representatives from the American Institute of Architects—

Louis Ayers Robert D. Kohn

Representatives from the Manufacturers—

Albert Blum Otto Heinigke

Harry Wearne John Polachek

M. B. C. Crawford Embury Palmer
(Assistant Curator of Textiles, American Museum of Natural History).

The teaching staff of the New York school has been recruited, and instruction will begin as soon as the school can be organized. Subjects which will be covered are furniture, tapestries, textiles, ornamental glass, wrought metal, and allied arts and crafts.

Similar schools will be established in other cities, with their own governing boards, but under the supervision of the national body.

The sponsors for the movement are The Architectural League of New York, the National Academy of Design, the American Institute of Architects, and the manufacturers whose products are dependent on the arts and crafts.

The Proposed Nebraska State Capitol

The legislature of the state of Nebraska has authorized a new state capitol, for which funds are to be made available in the sum of $5,000,000. Recognizing the opportunity thus created, the Nebraska Chapter of the American Institute of Architects has urged upon the state authorities that the architect for the capitol be selected by competition among the first architects of the country.

St. Paul's Cathedral—The Progress of the Work of Preservation

The last stone in the restoration of the southwest pier was placed in position by Canon Alexander, a few weeks ago, after five years of uninterrupted work and anxiety;

and it is gratifying to know that the first, and, perhaps, most critical part of a far-reaching scheme—the practical rebuilding of this vital support of the dome—has thus been brought to a satisfactory conclusion.

It is clear, however, from the fact that the cement injected to solidify the walls has in some places found its way out through long fissures into the street and gardens outside, that the whole of the south transept has been badly shattered by the excessive weight of the dome; and it may yet be found that the southeast pier, on which the work is already steadily progressing, is in a condition not less serious than that of its neighbor. The widespread use of iron, which has everywhere rusted and split the masonry, is only one of several causes of deterioration.

If the work had not been taken in hand when it was, it is evident either that some disaster would before long have befallen the cathedral, or that the advancing decay would have rendered the task of repair almost, if not quite, impossible; and in any case there has been a danger of falling stones, which, though diminished, is not altogether removed. The slowness of the preservation work has been due to the extreme delicacy of it, as well as to the constant interruption of the services.

As seven piers have still to be dealt with, a long period of time must elapse before the cathedral is safe, and meanwhile the increasing cost of labor and of materials of all kinds constitutes a new problem. For so national an enterprise, however, it will be felt that Canon Alexander, whose appeals have produced about £50,000 for the fabric, will not have to plead for the funds necessary to enable the work to be carried on without delay. Where is the rich man who will win for himself an easy immortality by supporting the dome of St. Paul's, as St. Francis is said to have propped up the Vatican? At any rate, where Wren's masterpiece is in question the country can afford to take no risks.—*Westminster Gazette.*

New Firms and Changes

Mr. Clarence S. Stein announces the opening of his office at 331 Madison Ave., New York City.

Messrs. Thomas Gannett Holyoke and Holyoke Davis announce the formation of the partnership of Holyoke & Davis, with offices at 649 Endicott Building, St. Paul, Minn.

The partnership of Berlin, Swern & Randall, Architects and Engineers, 19 S. La Salle St., Chicago, is announced, the principals being Robert C. Berlin, F.A.I.A., Perry W. Swern, A.I.A., and Frank A. Randall, M.A.S.C.E.

The American Housing Competition

We regret the delay in announcing the award in the American Housing Competition, but the reason is easily understood when it is known that each manuscript submitted had to be copied with great care, proof read with equal care, and copies distributed to each member of the Jury. The drawings submitted were photographed and prints have likewise been made available to the members of the Jury. It is hoped to announce the awards in the next issue of the Journal.

Obituary

Wilfred E. Griggs

Elected to the Institute in 1907
Died at Waterbury, Conn., July 24, 1918

Mr. Griggs was born in Waterbury, Connecticut, May 2, 1866. He was a graduate of the Sheffield Scientific School at Yale, and of Columbia University. After graduation from Columbia, Mr. Griggs worked in several New York offices until 1891, when he moved back to Waterbury and practised architecture, for several years associated with Mr. R. W. Hill, then for himself until his death.

C. E. Hartge

Elected to the Institute in 1916.
Died at Raleigh, N. C., October 25, 1918.

Mr. Hartge was born in Hamburg, Germany, September 1, 1865. He is survived by his widow, three daughters, his mother and several brothers and sisters.

Mr. Hartge came to this country at the age of seventeen and he built up an extensive practice in architecture in North Carolina and adjoining states, specializing in houses of worship, state and county buildings.

He was very much interested and instrumental in having passed by the General Assembly of North Carolina the act to regulate the practice of architecture in that state. He was the Board's first and only secretary, holding the position at the time of his death.

Captain Walter S. Keller

Elected to the Institute in 1914.
Killed in action, St. Mihiel, France, September 17, 1918.

Captain Keller came from Los Angeles, Calif., and was transferred from the Southern California Chapter to the Michigan Chapter. He enlisted in Pioneer Engineers and was commissioned captain in May, 1917. He went to Fort Benjamin Harrison and left for France, in February, 1918.

Captain Keller was carrying out very important and dangerous work and was just about to withdraw his men when killed.

He was buried at Viéville-on-Haye near Thiaucourt.

William Ernest Walker

Elected to the Institute in 1901.
Died at Chicago, December 26, 1918.

Born, November 19, 1867, at Covington, Kentucky. Prepared for college at Lakeville, Conn., and was graduated from Yale University in 1891.

Mr. Walker was associated with Henry Ives Cobb for many years and later with the Architectural Department of the Chicago Board of Education. He practised for himself since 1899. Mr. Walker was architect of many of the better class fireproof apartment buildings in Chicago, and also did many commercial buildings.

Structural Service Department

SULLIVAN W. JONES, *Associate Editor*

In connection with professional societies, organized bodies, and the following Committees of the Institute, working toward improvements in building materials and methods, and higher ideals in the sheltering of humanity:

BASIC BUILDING CODE, CONTRACTS & SPECIFICATIONS, FIRE-PREVENTION, MATERIALS & METHODS, STRUCTURAL SERVICE

SERIAL 3—FLOORING

CLASSIFICATION OF FLOORING

(For index of subjects previously treated, see Index on page 135 and consult the General Index in Structural Service Book, Vol. I)

Concrete 2A
Wood 2B, 3B
Tile—Composite and Elastic 3C
Magnesium Oxy-chloride 3D
Mastic 3E
Tile Cork 4F
Tile, Clay and Ceramic 4G
Marble 4H

Floors, Wood, continued. 3B

3B1 Materials: (2B3, continued.)

Condensed data in tabulated form, giving the various gradings, dimensions and nailings for finished flooring, grouped with respect to species, is in course of preparation and will be published under Serial 4.

"Gum" flooring was used extensively by the Government in its emergency war construction. A large proportion of the flooring so used was discolored with sap. The material warps and twists, and the grain is most irregular. The waste in laying runs as high as 25 per cent.

An excellent finished floor for factories, mills, and warehouses may be laid of short lengths of maple or oak, that is, lengths 6 feet and less. Such short-length flooring may be secured in limited quantities at a cost considerably lower than flooring of standard length. The labor cost of laying short lengths is very little in excess of the labor cost of laying standard lengths.

There is a light-weight oak flooring which is not infrequently used when the price paid for the floor is low. This light-weight material complies in the matter of standard defects with the standard grading rules, but is in appearance and structure much like chestnut. To provide grounds for justifying the rejection of such material when offered for use, it is well to specify a minimum weight as well as the standard grade. Kiln and dried, plain or quarter-sawed, red and white oak should weigh not less than 4,000 pounds per thousand square feet.

3B2 Special Treatments of Finished Flooring:

Finished flooring, to be laid over fresh concrete fill, and particularly where the underfloor is omitted, should be treated to render it damp-proof. This is usually done by applying to the underside of the flooring-strips, either at the factory or before laying, a coat of heavy damp-proof paint. The paints which have proved most satisfactory for this purpose are those made with a heavy hydro-carbon base.

For further information relative to **Damp-proof Paints**, see **Hydrex Felt & Engineering Co.**, page XXII, **Industrial Section.**

3B3 Fireproofing:

Many of the city building codes require wood-finished floors, in buildings of certain types and in excess of certain heights, to be fireproofed. Reference should be had to such building codes before specifying wood flooring. The process of fireproofing is usually that of impregnating the flooring with a silicate solution by the vacuum and pressure process. There are companies that specialize in this treatment.

3B4 Treatments to Prevent Dry Rot:

Sleepers to be embedded in concrete fill, and heavy plank underfloors laid on reënforced concrete floor arches or concrete floor fill which has not thoroughly dried out, should be treated to prevent dry rot. There are two classes of antiseptics which have been found to be effective for the prevention of dry rot. One class includes the creosote distillates of tar; the other, the various metallic salts used in water solution.

The creosotes are highly toxic, and, for all practicable purposes, are permanent. The oil must be forced into and diffused through the wood. This is done by the vacuum and pressure process. From five to ten pounds of oil to a cubic foot of wood should be injected. The amount of oil injected is determined by weighing test-pieces before and after treatment.

The metallic salts show a tendency to leach out of the wood and are therefore of questionable efficacy for exterior work. They are slightly corrosive, though not sufficiently so to mitigate against their use in construction. They also seem to decrease slightly the strength of the wood treated with them. The salts are used in water solution, and are toxic in proportion to the strength of the solution. The following solutions are those which have been found to be sufficiently toxic to prevent fungus growth.

Corrosive sublimate (mercury bichloride), 1 per cent solution.

Zinc chloride, 2½ per cent solution.

Sodium fluoride, 1 per cent solution.

The saturation of the wood, through prolonged soaking, especially in the mercury bichloride solution, has been found to be inhibitive to rot. The time of such emersions should be twenty-four hours for each inch of the least dimension of the wood, plus twenty-four hours. If wood treated by emersion is cut after treatment, all cut surfaces should be brush-coated with the antiseptic solution, because the penetration secured through emersion is only about ¼ inch.

3B5 Block Floors:

Block floors have given excellent service in mills, factories, foundries, and warehouses, where they are subjected to heavy traffic.

The woods used for the manufacture of flooring or "paving" blocks are generally yellow pine, gum, and fir. They are usually impregnated with creosote in precisely the same manner as above described in connection with the discussion of the prevention of dry rot in sleepers and underfloors. (See 3B4.) These blocks are made with and without spacer lugs. They are also made in hexagonal form without lugs.

There is another type of block flooring known as "Bloxomend." These blocks are not treated to render them waterproof. They are secured by a dovetail joint to a base strip and are laid with splines between the strips. The manufacturer and distributors of this flooring will not lay it under what they term a "moisture risk," that is, where it is likely to be subjected to conditions which would result in its expansion. These blocks are made of yellow pine.

The creosote blocks are laid in two ways: First, on a sand bed, with joints pointed with Portland cement grout; and, second, in a bed of hot mastic with the joints filled with hot mastic. The latter method has proved most satisfactory for interior floors.

See **Long-Bell Lumber Co.**, page XI, **Industrial Section.**

3B6 Waterproofing Mill Floors:

To eliminate the water-hazard in factories, mills, and warehouses, the waterproofing of floors is now considered good practice, and is recommended by the Fire Underwriters and the Associated Factory Mutual Fire Insurance Companies. This is done by laying over the underfloor a waterproofing membrane consisting of two thicknesses of tar or asphalt saturated felt, laid in precisely the same manner as for felt and pitch or asphalt roofs. The finished floor is laid over the waterproofing membrane before the pitch or asphalt top mop coat has become hard, so that the nail-holes are self-healed. The intersections of such floors with walls and columns should be flashed. Where floors are waterproofed, scuppers should be built into the exterior walls. For detailed information, see pamphlet issued by the Associated Factory Mutual Fire Insurance Companies, entitled "Water-tight Floors of Mill Construction."

For further information on "*Membrane Method*," see **Hydrex Felt & Engineering Co.**, page XXII, **Industrial Section.**

Tile, Composite, Elastic. 3C

3C1 Nomenclature:

Tile floor-coverings at present available, which possess the characteristic of elasticity, are two in number:

(*a*) Composition (linoleum).

(*b*) Rubber.

(*a*) Composition (linoleum) tile is marketed under various trade names such as "Beaver," "Everlastic," "Linotile," "Dreadnought," and

"Unico." The material from which these tile are made is manufactured in sheets by producers of linoleum. It is composed of the same materials and manufactured under the same general process as linoleum. The material is, in truth, high-grade linoleum, especially cured, of battleship weight, or slightly heavier. The tile are cut from these sheets in a die-press.

There are two principal reasons advanced for the use of this tile in preference to linoleum in sheet-form: one, that linoleum shrinks through aging, and, where it is used in tile-form, the shrinkage is distributed throughout a large number of joints and is therefore less noticable; and, two, that the material may be laid in patterns and designs which are not possible to secure in sheet linoleum.

Tile of this description are made in interlocking patterns, similar to rubber tile, and also in rectangular shapes of various dimensions. The rectangular tile are sometimes laid with joint fillers of the same material, but usually of a different color from the tile, to produce the effect of a tile floor laid with pointed colored cement joints.

Many of the earlier installations developed serious defects. The tile crushed under furniture in the same way as the poorer grades of linoleum. This defect has been largely overcome by changes in composition. The tile also cupped as the linseed oil content oxidized and the exposed surface hardened, through the failure of the setting cement to securely hold the tile to the base. Much study has been given to the development of suitable cements possessing the required characteristics of body, adhesiveness, low ductility, and resistance to the disintegrating effect of moisture. The cupping of tile is now almost absent as a defect in such floors.

The side joints in rectangular tile are cemented, as well as the backs. This cannot be done with the interlocking tile, which are usually laid in sheets as they come from the die-press, with the result that the joints open slightly in time, and moisture is apt to pass downward through the open joints and beneath the tile, breaking the cement bond at the base.

Such tile may be laid satisfactorily over wood or cement floors. When laid over wood floors, the surface to receive the tile must be smooth and composed of well-seasoned wood. It is good practice to stretch over the wood floors a cotton drilling, which is held in place by tacks spaced not more than 6-inch centers in both directions. The tile is then laid over the cloth in a bed of cement in the same manner as tile laid on a concrete surface.

(*b*) Rubber tile. (See Serial 4.)

Floors, Magnesium Oxy-Chloride

3D1 Nomenclature:

Magnesium oxy-chloride floors are popularly referred to as "composition floors" and "magnesite" floors. The term "magnesite" is preferable to "composition," first, because one of the basic elements in the floor is magnesite, and, second, because the word composition is most indefinite.

3D2 Development:

Magnesium oxide, in combination with magnesium chloride, forms a hard and durable cement, comparatively slow-setting and slightly resilient. This cement is the base of all magnesium oxy-chloride floors.

Such floors originated in Europe and have probably reached the highest mark of perfection in Austria and Germany. They came into general use in the United States about 1906. Owing to the large number of failures, they have acquired a questionable reputation, which is unfortunate, because floors of this character can be laid with almost uniformly satisfactory results. Failures, without exception, may be attributed to carelessness or a lack of knowledge of the materials employed.

A great number of contractors are engaged in the business of laying such floors, but many of them are ignorant and irresponsible, and have engaged in the business primarily because it requires but a small investment. Hardly a month passes that some composition floor contractor does not fail and a new one spring up to take his place. Contracts are secured by firms that are virtual impostors, because they can refer to a few successful floors, generally of small area, laid by them either at a loss or by accident.

The setting of magnesium oxy-chloride cement is affected by impurities in the magnesium oxide and chloride, by the proportioning of them, by the other ingredients used, by the temperature and humidity of the air during the period of setting, by the character of the base to which the material is applied, and by the mixing and troweling.

As the result of study and experimentation in the development of formulas for the compounding of the ingredients, and in the adaptation of European formulas to climatic conditions in the United States, a relatively small number of manufacturers are at present able to lay floors of excellent quality with a negligible percentage of failures. Probably no two of the formulas used are exactly alike. They have been developed independently and are held secret.

To the magnesium oxy-chloride cement, the base of all such floors, various other materials are added, as fillers, binders, waterproofing oils, coloring matter, etc., to produce certain desirable and sometimes essential characteristics. A description of each ingredient and its function, the methods of preparing the compounds, mixing and installation, and the causes of failures, will aid the many, who regard composition floors as a mystery, in acquiring the knowledge needed to make a safe selection.

Successful work depends upon an accurate knowledge of the materials used, the careful selection and compounding of them, and skill in application. When so many requirements contribute to success and when the neglect of any of them means failure, knowledge and experience must indeed be essential.

3D3 Ingredients:

Magnesium Oxide. Oxide of magnesium is derived by the calcination of magnesium carbonate, a natural mineral rock known as magnesite. The bulk of magnesite used in this country prior to the war was mined in Greece and calcined and ground in Holland, Germany, Italy, and also in Greece. The material now generally in use is mined in California and Canada.

The calcination or burning of the magnesite rock must be done at such a temperature that all of the carbon-dioxide content is driven off, about 1½ to 2 per cent remaining, which is required to insure proper chemical reaction with the magnesium chloride. Calcined magnesite which contains no carbon-dioxide is referred to as "dead burned," and has lost its caustic properties. Much of the magnesite rock contains a small percentage of lime as well as other impurities. Even a small percentage of lime in the calcined magnesite is most detrimental, because it creates an irregular set in the cement, thereby creating stresses which may later result in cracks in the floor. An excess of carbon dioxide, in combination with free lime, causes expansion which will bulge or buckle the floor.

Magnesium Chloride. Before the war, magnesium chloride was secured almost exclusively from Germany, and was a byproduct of the potassium mines in that country. The domestic magnesium chloride now in use was at first of very poor quality and contained large amounts of impurities. The quality of the product has, however, been greatly improved but still has to be carefully examined for the presence of impurities, such as calcium chloride and sodium chloride, which, if not taken care of, will insure the failure of the floor.

The strength and proportion of the chloride solution affects the hardness of the cement products by its combination with the oxide of magnesium. The strength and specific gravity of the chloride must be accurately fixed. An excess of chloride will affect the set of the cement and cause fading. The amount of chloride required to produce the proper reaction depends somewhat on the temperatures prevailing at the time the floor is installed, the atmospheric humidity, and the porosity of the base upon which the floor is placed. The amount of chloride is altered by changing the strength of the chloride solution, the quantity of the solution, in proportion to the dry materials held more or less constant to produce the mortar of proper working consistency.

Fillers. A number of materials are used as fillers in magnesium oxy-chloride floors, such as silex (finely ground silica), brick-dust, fine asbestos, infusorial earth, clay, wood- and cork-flour. Manufacturers generally recommend the use of either wood- or cork-flour exclusively.

Such floors are of two types: two-layer and single-layer. In the two-layer floors, the material for the under layer, or rough coat, generally contains a larger percentage of wood or cork and is of a coarser character than the finished layer. The wood in the under layer is in the form of coarse sawdust, and the cork is usually granulated. Wood-flour is generally made from soft point.

Wood-flour seems to be more generally in use as a filler than cork-flour. The manufacturers who use the cork-flour contend that wood-flour should not be employed because it swells in the wet mix and shrinks to its original size when the material has set and become dry, thus producing a porous floor. All manufacturers agree that the fillers used must possess absorbent characteristics in order to take up any reasonable excess of the chloride solution, thereby permitting the proper set. The filler must also have a low specific gravity in order that it may mix properly with the other ingredients and produce a floor of the proper consistency for troweling. Hence, mineral or other inert non-absorbent fillers do not function in the mix, except as they effect the hardness of the floor. For the purpose of regulating the hardness of the finished floor, and to aid in troweling, silex—finely powdered silica—is added in quantities from 4 to 10 per cent by volume of the dry material.

Composition floors containing no silex or other mineral ingredient are being installed in powder and fuse factories, and are designated as "flash-proof floors," the mineral being omitted to eliminate the danger of sparking from striking with metal.

Binders. Binders are used to give such floors greater tensile strength. These binders are such fibrous materials as hemp, cocoanut, sisal, or asbestos. They are used singly or in combination.

Coloring. The natural color of the finished magnesium oxy-chloride cement is a light gray. Various colors are produced by adding pigments to the mix. Pigments so used must be inert and of a character that will resist the attack of the chloride solutions. Finely ground, pure mineral pigments are the best. Almost any color or shade can be produced in the finished floor, but the blues, greens, and yellows have not been found to be permanent. The most satisfactory colors are the buffs, browns, and reds.

Oils. Prepared oils are sometimes added to the mix in small percentages to reduce absorption by the finished floor. The oils used are generally mixtures of light hydrocarbons and vegetable oils combined under heat. Some manufacturers claim that the use of oils in the body of the floor is not advantageous. We know, however, that the addition of percentages of oils does reduce the permeability of the floor. Whether or not the effect is permanent we do not know.

3D4 Compounding:

The foregoing descriptions of ingredients and their uses indicate that great care must be used in the selection and proportion of the materials. Extreme precautions must be taken to detect the presence of impurities in order to insure the production of a satisfactory composition. This requirement imposes upon the manufacturer who would produce successful floors the necessity of careful preliminary laboratory work. It appears that most manufacturers use a constant proportion of magnesium oxide to the total amount of dry materials. It is known that cement formed by the combination of the oxide and chloride must contain a definite proportion of each fixed within very close limits.

Analyses of different manufacturers' materials have shown a percentage of magnesium oxide varying from 25 to 60 per cent. It appears that the density of the fillers used regulates the amount of magnesium oxide. When the chloride solution is used in excess, it does not all combine with the magnesium oxide, and the surplus chloride which is not neutralized will attack the coloring pigment, producing fading and the other phenomena sometimes seen in the finished floor, "sweating." Insufficient chloride will leave some of the magnesium oxide in its original condition, and a soft cement will result. Therefore, the chloride is generally used in slight excess, and the fillers are relied on to take care of any excess that may remain after reaction with the oxide. If the base upon which the floor is laid is absorbent, and it usually is, it will take up some of the excess chloride.

Manufacturers make the claim that the physical characteristics of the composition can be altered, i. e., either a warm, resilient, or a hard, stone-like floor can be produced by altering the formula. It may, however, be stated that the hardness of the floor is affected by the fillers used; mineral fillers, such as asbestos, clay, and infusorial earth, silica, and the like, produce a hard, stone-like floor, whereas vegetable fillers, such as wood-flour, cork-flour, silicious vegetable fiber, peat, and the like, produce a resilient, wood-like product.

3D5 Installation:

Magnesium oxy-chloride floors are installed over a base of Portland cement concrete or over metal or wood. It is claimed that the flooring material will effectively bond to all of these base materials. However, it is found necessary to provide a mechanical bond for the material when applied to wood. When applied to wood, the bond employed is usually expanded metal lath, either painted or galvanized, stapled to the wood or clout nails driven into the wood 6 inches on centers in both directions.

When applied to metal, the same can be either chipped or provided with clamps to give a bond. Large areas of flooring have been successfully laid on steel decks of vessels, for instance, by applying two coats of "Elatorite," letting the first coat dry before applying the second, and then immediately laying the composition floor material on this soft coat.

Such floors are laid in plastic form in either one or two layers. The double layer floors are generally ¾ inch thick, each layer being half the total thickness. Single-layer floors are generally ½ inch thick. When double-layer floors are applied to a Portland cement concrete base, the best practice seems to require that the base shall be strong cinder concrete, a 1:4:5, or preferably a 1:2:4 mix, screeded level, not troweled, but scratched or raked. For single floors, the concrete base must be prepared with a troweled coating of cement mortar, leveled and scratched or raked.

The dry materials, in powdered form, that is, the magnesium oxide, fillers, fibers, and coloring matter, are mixed at the factory and delivered in bags. The chloride solution is added to the dry materials immediately before installation. Only enough chloride solution of the proper strength should be added to the dry materials to make a mix of the consistency of putty. The material must be thoroughly compressed and worked under the trowel. It should be of such consistency and composition that a polished surface can be produced under the trowel without the application of surfacing oils. Nearly all composition floors are improved by an application of prepared oil or wax after the floors have thoroughly set.

The concrete floor fill, or concrete floor over which the magnesite floor is to be placed, should not be installed until after the plastering is finished The reason for precaution is that lime or plaster paris, spilled upon the base upon which the magnesite floor is applied, will result in blister or bulges.

It should also be borne in mind that concrete expands and contracts, and, for this reason, expansion joints are provided in floors of large area. It is impossible to lay a magnesite floor over these expansion joints without developing cracks. It is advisable, therefore, to subdivide magnesite floor with joints coincident with the expansion joints in the base. Frequently settlements in fireproof construction results in cracks for supporting steel beams and supporters. Such cracks will carry through the magnesite finished floor. It is therefore advisable to lay strips of magnesite flooring over such points of support. If they crack they can be easily replaced without disfiguring the entire floor.

Magnesite floors should not be laid until all mechanics, except painters, are through with their work. No traffic should be permitted on magnesite floors for a period of three days after completion. Such floors should be protected, and the best protection is a coat of dry sawdust. Paper covering is liable to affect the color of the floor.

Floors, Mastic 3E

3E1 Characteristics and Types:

Mastic floors are acid-proof, waterproof and dustless. They are of two types; namely, heavy service floors which are 1 inch or more in thickness, laid in mass and rolled down, and light service floors, usually ⅛ or 1/16 inch thick, and laid in a series of thin coats. The latter type is comparatively new, having first been laid in 1914.

The heavy service floor is suitable for use in factories, warehouses, and pressrooms. The other type is becoming popular for offices, laboratories and kitchens.

3E2 Heavy Service Floors:

Mastic floors of this type are common. They are laid in varying degrees of hardness, according to the service requirements. These requirements should be carefully determined in advance of compounding the material. If trucks are to be used on the floor, maximum loads and the width of wheel-tires should be specified.

3E3 Light Service Floors:

Mastic floors of this type are laid as thin as ⅛ inch. Experience seems to indicate that a minimum thickness of 1/16 inch is required for durability and service. Such floors should be laid in not less than five trowel coats.

The material for these floors is a combination of hydrocarbons. The base is usually a rock asphalt, cut with a light hydrocarbon, such as naphtha. Mixed with this material is short asbestos fiber, Portland cement, and finely ground silica; also, if desired, coloring matter, usually oxide of iron. The only colors that can be produced are dark red and brown.

These floors are laid in multiple coats, so that the thinner used may evaporate from each coat before the surface is sealed by the succeeding coat. If this were not done, and the whole thickness applied in one coat, the floor would remain soft for a long period. Each coat should cure for 24 hours before the succeeding coat is applied. No traffic should be permitted on the finished floor for 3 days.

Mastic floors of this character dent but have a tendency to self-heal. They are easily repaired. The resistance to denting can be increased by increasing the percentage of silica and cement, but at the sacrifice of ductility. The effort in compounding the material is constantly in the direction of finding the happy medium between ductility and brittleness which will give the best floor service.

Light service mastic floors may be laid over concrete (smooth-troweled surface) and metal. They are also laid over well-seasoned wood floors as a "scratch" or rough magnesium oxy-chloride. (See 3D5 F.)

For further information upon **Mastic Acid-proof Floors**, see **Hydrex Felt & Engineering Co.**, page XXII, **Industrial Section.**

Standard Construction Classification

The Committee on Structural Service again urges the readers of the Journal to contribute thoughts on a standard classification.

In this connection, they are referred to page 87 of the February issue of the Journal. It is of the utmost importance that a suitable classification for the material appearing in the Structural Service Department be decided upon at an early date.

New Method of Procedure Adopted by the Electrical Committee of the National Fire Protection Association

The Electrical Committee of the National Fire Protection Association, which has charge of the National Electrical Code, at a meeting held in New York, March 4 and 5, adopted a new procedure for discussions of Code rules and for the preparation of future editions of the Code.

The purposes aimed at are to provide an established method of dealing with proposed changes, secure their early and deliberate consideration by all who are concerned with Code affairs, and to encourage and provide for a more orderly participation in investigations and recommendations for changes in the rules than heretofore, both by the various associations having representatives on the Committee and all others in any way interested.

The plan in general includes the division of the Electrical Committee into standing committees having charge of groups of subjects and the general supervision of the work of technical subcommittees which will report to them. Each standing committee is charged with the duty of advising all associations, companies, or individuals, especially interested in the topics supervised by the Committee, of items under consideration and inviting comments, criticisms, and assistance.

The Bulletin issued by the Electrical Committee just before each of its biennial meetings for revising the Code will consist chiefly, if not wholly, of the reports and recommendations of these standing committees. It is hoped and intended that such reports shall be so fully discussed before the Bulletin is issued that they will have been well understood and their recommendations have been quite generally endorsed by all those who are most concerned with them and who are best qualified to judge of them.

It is evident that the success of this method will depend not only on the work of the Standing Committees but quite as much upon the cooperation of other organizations and individuals. This coöperation the Electrical Committee earnestly desires and solicits.

Before final action is taken by the Electrical Committee on a new edition of the Code, a public hearing is to be held for the discussion of standing committee reports and such other matters as an advisory committee may recommend for consideration. The final action on the Code will be taken after the public hearing, and with due regard to evidence and opinions developed by it.

The standing committees are to be assigned charge of the following ten general groups of subjects: Grounding Rules; Industrial Applications; Cars and Railways; Devices and Materials; Outside Wiring, Building, Supplies, and Services; Wiring Standards and Systems; Generating and Substations; Theatres, Moving-Picture Establishments, Garages, and other Special Buildings; Lamps, Fixtures, Heaters, and Signs; Signal Systems. The personnel of these committees will be announced shortly.

All suggestions for changes in the next edition of the Code (that of 1920) should be sent as soon as possible to Dana Pierce, Chairman of Electrical Committee, N. F. P. A., 25 City Hall Place, New York City.

The formal statement of the new procedure as adopted by the Committee is as follows:

Statement of Procedure of the Electrical Committee of the National Fire Protection Association

Committees:

Except as expressly directed by the Electrical Committee as a whole, the work of investigation and reports on technical and engineering subjects affecting the National Electrical Code shall be conducted by and through two classes of committees to be known as standing committees and technical subcommittees.

The appointment of such committee is not intended by the Electrical Committee to establish any hard and fast limitations of responsibility or of authority, or to restrict in any manner the interest or activity, either of any member of the Committee itself or of any coöperating association or individual, and it is expected and intended that the work of committees will, as heretofore, be assisted and supplemented by others through general and deliberate discussion of all changes and revisions of the National Electrical Code.

Standing Committees:

1. Standing committees shall be appointed to receive suggestions, initiate action, and organize investigations. They shall invite opinions and statements of experience from associations, bureaus, organizations, and individuals interested in subjects under consideration by the Electrical Committee for the betterment of the National Electrical Code.

2. Standing committees shall be composed of members of the Electrical Committee and shall be appointed by the Chairman.

3. The duties of a standing committee shall be:

(*a*) To act as advisors to the Electrical Committee and its technical subcommittees on the most suitable and appropriate methods of relating the work of the Electrical Committee to that of associations, bureaus, and other organizations, both those represented on the Electrical Committee and also others interested in or affected by the Committee's work.

(*b*) To advise the Chairman of the Electrical Committee of topics which should receive consideration.

(*c*) To receive from technical subcommittees reports as prepared from time to time, referring these to other associations, as may be desirable, for concurrence, criticism, or suggested changes in advance of final recommendation to the Electrical Committee.

(*d*) To render to the Electrical Committee reports on all matters referred to it. Such reports may contain recommendations for or against changes in the National Electrical Code and shall indicate which portions of the report should properly be included in the Bulletin. All reports to be acted on at the regular biennial meetings of the Electrical Committee shall be filed by the standing committees with the Secretary on or before December 1, preceding such biennial meeting, except that, by vote of the Advisory Committee, reports filed at a later date may be presented to the public hearing and subsequently acted upon by the Electrical Committee.

Technical Subcommittees:

Technical subcommittees shall be appointed by the Chairman of the Electrical Committee, either as judged necessary by him or by direction of the Electrical Committee, or upon the recommendation of a standing committee.

Technical subcommittees shall be composed either of members of the Electrical Committee or of other persons, or both.

The chairmen of technical subcommittees shall be designated by the Chairman of the Electrical Committee.

Topic or topics to be dealt with by each technical subcommittee shall in general be designated by the Chairman of the Electrical Committee, but other related topics or phases may be acted upon and reported.

Upon the appointment of each technical subcommittee, its chairman shall be advised with which standing committee he shall confer and to which he shall report. He shall as promptly as possible advise both the members of his subcommittee and of the designated standing committee of the nature and scope of the subjects to be acted upon and invite their active coöperation.

Advisory Committee:

There shall be an Advisory Committee consisting of the Chairman and Secretary of the Electrical Committee, and the Chairman of the standing committees.

The Advisory Committee shall hold a meeting shortly before the public hearing, at which it shall determine which committee reports and other recommendations and suggestions received too late for publication shall be presented for consideration at the public hearing and for subsequent action by the Electrical Committee.

Procedure for Public Hearings:

The meetings of the Electrical Committee, for revision of the National Electrical Code, will ordinarily be held between the 1st and the 15th of March every other year.

Prior to a meeting of the Electrical Committee, at which final action is to be taken on the next edition of the National Electrical Code, a public hearing shall be held.

In advance of a public hearing the Secretary shall prepare and issue a Bulletin of the subjects to be considered. This Bulletin shall contain reports and recommendations from the standing committees and from the Electrical Committee as a whole.

Reports, recommendations, or suggestions received from standing committees or from other sources, too late for inclusion in the Bulletin may be considered at the public hearing upon the recommendation of the Advisory Committee.

Votes taken at a public hearing shall be recorded as expressing the sense of the meeting.

After the public hearing the Electrical Committee will consider and act on all reports, recommendations, and suggestions for the next revision of the Code.

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